GOULD:

REPORT ON FOOD
AND DIET.

A

REPORT

ON

FOOD AND DIET,

WITH OBSERVATIONS ON THE

DIETETICAL REGIMEN,

SUITED FOR

ALMSHOUSES, PRISONS, AND HOSPITALS;

ALSO ON

HEATING, VENTILATION, &c.,

WITH

PRACTICAL RECOMMENDATIONS.

BY

THE HON. JOHN STANTON GOULD.

PREPARED AT THE REQUEST OF THE

BOARD OF COMMISSIONERS OF EMIGRATION,

AND THE

BOARD OF GOVERNORS OF THE NEW YORK ALMSHOUSE DEPARTMENT.

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INTRODUCTORY LETTER.

HUDSON, 1st Mo. 1st, 1852.

I herewith submit a report on the matters submitted to my examination by you. You need no information relative to its history, but others may desire to know something of the motives which induced *you* to seek the information, and me to attempt to give it.

The Commissioners of Emigration were organized under circumstances of peculiar difficulty. An immense flood of emigration set upon our shores in consequence of the famine in Ireland, and civil commotion in other portions of Europe. The emigrants were mostly very poor, they were landed in a state of great destitution, and many were suffering from severe disease. This state of things could not be adequately met by private charity or by any existing institution. In this emergency, the legislature of 1847, organized the Board of Commissioners of Emigration, granting them funds barely sufficient for the ordinary support of the masses who were seeking relief from their hands. It was impossible to hire buildings, the fears of the community lest contagion might reach them from the asylum, imperatively demanded that it should be placed in an isolated position. These circumstance requiring a large outlay, at once, and without delay, imposed a necessity on the Commissioners to practice the most rigid economy in all the details of their management.

Among other plans of economy, the attention of the Commissioners was directed to the best mode of feeding the persons under their care, but nothing could be found in books to guide or assist them in their inquiries. Under these circumstances, my friend, Cyrus Curtiss was appointed by the board, in the spring of 1850, a committee to procure a suitable agent to visit the best institutions in our country, who should study the system of management pursued in each, and also seek information in relation to the cheapest and most nutritious kinds of diet, with the most economical processes for their preparation.

Knowing that my attention had been turned to these subjects for many years, he did me the honor to invite me to accept the agency,

but owing to pre-existing engagements I was at that time unable to accept it, nor could any suitable person be obtained. The next year, the Ten Governors (having in charge the charitable and criminal institutions of the city) feeling the same difficulty, and being desirous of more full information on the subject of diet than they possessed, appointed a committee to co-operate with the committee of the Commissioners of Emigration, with a view to procure information on the subject. Being again invited, I accepted the agency and visited many of the best managed institutions in the country, and under the instructions of the joint committees (Messrs. Minturn and Curtiss, of the Commissioners, and Messrs. Halstead and Henry, of the Ten Governors,) I endeavoured to study as well as I was able the details of their dietetic and hygienic arrangements. The result of that study I herewith respectfully submit, in the hope that it may prove of some assistance to you in the prosecution of your arduous and uncompensated labor.

JOHN STANTON GOULD.

To Messrs. GULIAN C. VERPLANCK, Prest.,
ROBERT B. MINTURN,
GREGORY DILLON,
CYRUS CURTISS,
CHARLES H. MARSHALL,
FREDERICK KARCK,
ELIAS HICKS,
JAMES KELLY,
A. C. KINGSLAND,
CONKLIN BRUSH,
Commissioners of Emigration.

To Messrs. SIMEON DRAPER, Prest.,
RICHD. S. WILLIAMS,
J. J. CODDINGTON,
S. HALSTEAD,
J. J. HERRICK,
ISAAC TOWNSEND,
P. HENRY,
P. MCLAUGHLIN,
W. M. EVARTS,
J. DALY,
Governors of Alms-House Department.

To the Commissioners of Emigration and the Board of the Ten Governors of the New York Alms House.

Gentlemen,—The undersigned begs leave respectfully to offer for your acceptance the following

REPORT:

I propose to speak, 1st, Of the objects of Investigation. 2nd, Of the obstacles to a correct solution of the proposed problems. 3rd, General considerations respecting diet. 4th, To review the bills of fare given in this report. 5th, Of the consumption of food in families. 6th, Of various articles of food and the influence of cooking on their value as aliments. 7th, Of kitchens and cooking utensils. 8th, Of dining rooms and dining room furniture. 9th, Of dormitories. 10th, Of heating and ventilation. 11th, Of washing. 12th, Hygiene. 13th, Of labor. 14th, Practical recommendations. 15th, Conclusion.

I.—Objects of Investigation.

1st. What is the least amount, and what is the cheapest kind of food by which a prisoner or pauper can be supported so as to preserve his health and strength.

2nd. By what process of cookery can the nutriment in any given kind of food be most thoroughly extracted.

3rd. To ascertain what collateral circumstances influence either favorably or unfavorably the digestion and assimilation of food.

4th. To ascertain the relative values of all the usual varieties of aliments, with a view to the establishment of a scale of dietetic equivalents. For example, if a given number of ounces of beef will support a man in his full vigor for twenty-four hours, how many ounces of mutton, pork, or potatoes will support him in equal vigor for the same time; or how much of rice,

peas or beans will be equal to a pound of potatoes in health and strength giving properties.

5th. The most effeetual means of preventing peculation and waste of food in large institutions.

6th. To ascertain the influenee of the various modes of warming and ventilating, and the effect of different trades and occupations on the health and longevity of prisoners and paupers.

7th. To ascertain the most profitable means of employing paupers and prisoners consistently with their health and well being.

8th. To learn any other economie or hygienic improvement in the various Institutions of the country which might profitably be applied to the Institutions under your eare.

To sum up the whole matter, it was my intention to learn how prisoners and paupers could be supported with the least burden to the community, and with the greatest benefit to themselves.

II.—Obstacles to the Solution of the Proposed Problems.

When I commenced my researches, I hoped to be enabled to present you with satisfactory answers to all these questions, but now, when I have ended them, I find that I have signally failed. Nevertheless, I have succeeded in bringing together a great deal of information, highly interesting to all who are concerned in the management of public charities, and which, I believe, has never been collected and collated before.

Perhaps the best service that I shall be able to render you, is, to point out the causes of my ill success, and the means by which future inquirers may overcome the obstacles which so formidably obstructed my own path.

It might be supposed that when an inquirer had found an institution where the support per *capita* was the least, and where the health of the inmates was adequately maintained, he had accomplished his task, and that every other institution might insure similar success, by the adoption of similar means.

This, however, is a mistake, and if carried into practice would lead to the most disastrous results.

There are in fact scarcely any two institutions in the county, where the same diet in quantity and quality would preserve the partakers in equal health and strength.

This is exemplified clearly enough, under your own inspection. The Refuge at Ward's Island has for its neighbor on the north, The Nurseries at Randall's Island; and on the south, The Lunatic Asylum, and the Penitentiaries on Blackwell's Island. It is obvious that the dietary best suited to any one of these, must necessarily be ill-suited to the others in view of the difference between the circumstances of the individuals residing in them. The greater number of persons in the Emigrant Refuge, have been for a long time exposed to the double influence of an impure, and almost poisonous atmosphere engendered in the crowded steerage of a ship, and a miserably deficient allowance of food, both with respect to quantity and quality. As a necessary consequence of this privation of food and pure air, all the tissues of the body have become wasted and deteriorated; hence the hygienic indication, is clearly to supply them with food, in quantity and quality, sufficient not only to recruit the daily waste of the system, but to rebuild the tissues, wasted and worn down, by previous disobedience to physiological laws. As a farther consequence of their peculiar conditions, the power of the organs of digestion has become so far impaired, as to be unable to digest and assimilate the ordinary kinds of food in quantities sufficient for their restoration to the normal physical condition; the quality of their food, as well as the quantity, should therefore receive special and continued attention.

The prisoners at the Penitentiary, on the other hand, are mostly robust men, engaged in hard labor, who are blessed with digestions which will easily convert into chyle, almost any alimentary substance in quantities which would well nigh cause the death of the feeble pauper at the Refuge.

Still less would the diet of the establishment just named, serve as a guide for the regulation of the diet of either the Lunatic Asylum or the Nursery. The former demands a far superior, and more various diet, than any of the others. The united testimony of all the intelligent physicians who have been intrusted with the management of the insane, establishes the fact with indubitable clearness, that a generous and attractive diet is one of the first elements of success in the treatment of this afflicted class of our fellow creatures. The little children at the Nursery, reared in the sickly atmosphere of cellars, and reeking with scrofula in all its protean forms, obviously require an entirely different diet from either of the others.

The above enumerated institutions are widely different from each other in their character and design; it therefore can be easily understood, that a diet that was well adapted to the one, would be no guide in the establishment of a dietary for one of the others. But even in institutions devoted to the same objects, a widely different scale of diet may very properly obtain. On consulting the table marked A, it will be seen, that in the House of Correction at Boston, 18 lbs. 10 oz. are allowed weekly to each prisoner, while at the State Prison, which is only three miles distant, 8 lbs. 28 oz. is the weekly allowance. We are not entitled to assume that the former allowance is too little, or the latter too much, without farther inquiry. In point of fact, the labor performed in the State Prison, which is chiefly hammering stone, is much more severe than that performed in the House of Correction; the daily waste of muscular and adipose tissue is greater in the one than in the other, and therefore requires a greater amount of alimentary reparation.

From what has been said, it is clearly apparent that the diversity of the circumstances of different institutions is an obstacle to our availing ourselves of their dietetic experience.

Another formidable obstacle to the acquisition of knowledge on the subject, is the little attention which has been paid to it by those whose especial duty and interest it would seem to be to collect and diffuse information in relation to it.

In the army $\frac{3}{4}$ of a pound of pork or bacon, or $1\frac{1}{4}$ lbs. of beef, are allowed per diem to each soldier. I enquired at the provision offices, and at the medical offices of each department whether any experiments were on record, by which it was established that $\frac{3}{4}$ lb. of pork afforded as much nourishment as $1\frac{1}{4}$ lbs. of beef. I was assured that there were no such experiments on record, that no one had ever thought of trying them, and that this regulation was purely empirical. All the officers acknowledged the desirableness of determining the relative values of different articles of diet, and expressed their willingness to afford aid in any investigations which might be deemed proper for settling the question.

I wished to ascertain what proportion of animal and vegetable food the average number of men spontaneously used when left free to regulate the proportion. I hoped to ascertain this point from the keepers of hotels, who of course are in the daily habit of providing for large numbers of guests; but among those to whom my

inquiries were addressed, not one was able to inform me what was the average consumption of food by their guests, and what is singular, not one would admit that he ever thought of the question before.

Can it then be a matter of surprise that I have failed to solve the problems which you submitted to me for elucidation, when those whose duty and interest alike conspire to prompt them to procure information on the subject, have never even given a single thought, or made a single effort to master its difficulties. I have failed to collect the information required, simply because it is not in existence. It remains to be created.

Another difficulty arises from the fact that much of the little knowledge we possess is ambiguous, from inattention on the part of collectors to the collateral circumstances which modify the observed facts.

If you glance over the table marked A, you will be struck with the difference in the quantity of food consumed weekly, at different institutions, you will also be struck with the variation in the kinds of food deemed proper. For instance, you will see, that in the States Prison, at Massachusetts, 28 lbs. 8 oz. of food are given weekly to each prisoner; at the House of Correction, 18 lbs. 10 oz. are deemed sufficient, and at the Washington Penitentiary, 15 lbs. 14 oz. is the allowance; again, 7 lbs. 8 oz. of meat are allowed weekly to each prisoner at Blackwell's Island, while 1 lb. 12 oz., are all that are allowed to the prisoners at Pentonville in England. The allowance of bread is alike at both places, while 6 lbs. 10 oz. more of potatoes are allowed at the latter than at the former. It would be a most interesting fact, if we could establish it, that these 6 lbs. 10 oz. of potatoes could replace the 5 lbs. 12 oz. of meat, by which the allowance at Blackwell's Island exceeds that at Pentonville.

I was myself much struck with these differences, and made every effort to account for them.

I was assured at every place I visited, without a single exception, that their men left them in a much better condition than they came to them. Every chief superintendent appeared to state this fact with great pride, each one seemed to suppose his own institution was distinguished from all others, by the improved physical condition of their men.

I have not the slightest doubt that every one of these officers really believed that it was so, but I was unable to verify the fact, because, except in two instances, no records of the weights of the men at the times of their reception and departure had been preserved. Had this been done at all places, with due attention to collateral circumstances, we should have been in a condition to settle the question in relation to the *quantity* of food required in a tolerably satisfactory manner.

Another obstacle to the settlement of these questions arises from the fact, that different constitutions require very different quantities of food. Very carefully conducted experiments made at Pentonville, show that *tall* men require more food than short ones, which fact would lead to a very different classification with respect to diet than any which has heretofore been established. Two hundred men were divided into two classes of one hundred each. One class was over 5 ft. 6 in., and the other class was under that stature. They were all fed alike, and at the end of three months they were weighed. Of the class over 5 ft. 6 in. in height, 59 lost weight, 30 gained, and 11 remained at their original weight.

Of the class under 5 ft. 6 in. 35 lost weight, 50 gained, and 15 remained at their original weight.

The average loss of the tall men was 2 lbs. 8 oz. Their average gain was 1 lb. 7 oz.

The average gain of the smaller men was 2 lbs. $8\frac{1}{10}$ oz. Their average loss was 2 lbs. $0\frac{8}{10}$ oz. There are no experiments on this side of the water, by which these experiments at Pentonville can be tested.

The result of another set of experiments at Pentonville, was, that those prisoners whose muscular exertions were greatest, required the most food. This result seems perfectly conformable to common experience, nor should we have any doubts of its correctness, had it not been that it was in direct opposition to the only set of experiments which have been instituted in this country in relation to it. At the Baltimore Penitentiary it was found, that with the same food, all the blacksmiths engaged in making railroad spikes, gained in weight, while the men in the broom shop, where the muscular effort is very greatly less than in the blacksmith shop, almost every man lost weight. I shall hereafter give the full details of the Baltimore experiments; I only alluded to them here to show the difficulty I experienced in collecting authentic facts.

Other obstacles will appear in discussing the remaining points connected with our inquiry.

General Considerations Respecting Diet.

Since a very large proportion of the anxieties and labors of mankind have from the earliest ages been directed to the procuring of their food, it might reasonably be supposed that greater progress in our knowledge of its properties, and of the best modes of preparing it, would have been made than in any other branch of human science.

We have seen how little such an expectation has been justified amongst practical men; nor has much more been accomplished by men of science. Yet it seems proper, in the present connection, to give a brief summary of their labors and their conclusions in this most important and extensive field of inquiry.

All matter is made up of certain elementary principles, which relatively considered, are few in number. These principles have hitherto resisted the utmost efforts of chemical skill to decompound them, or resolve them into simpler substances, hence they are called elements, or original forms of matter. They are as follows, being fifty-five in number.

1	Aluminum,	18	Glucinum,
2	Antimony,	19	Gold,
3	Arsenicum,	20	Hydrogen,
4	Barium,	21	Iodine,
5	Bismuth,	22	Iridium,
6	Boron,	23	Iron,
7	Bromine,	24	Lanthanium,
8	Cadium,	25	Lead,
9	Calcium,	26	Lethium,
10	Carbon,	27	Magnesium,
11	Cerium,	28	Mangenese.
12	Chlorine,	29	Mercury,
13	Chromium,	30	Molybdenum,
14	Cobalt,	31	Nickel,
15	Columbian,	32	Nitrogen,
16	Copper,	33	Osmium,
17	Fluorine,	34	Oxygen,

35 Palladium,
36 Phosphorus,
37 Platinum,
38 Potassium,
39 Rhodium,
40 Selenium,
41 Silicon,
42 Silver,
43 Sodium,
44 Strontium,
45 Sulphur,
46 Tellurium,
47 Thorium,
48 Tin,
49 Titanium,
50 Tungsten,
51 Uranium,
52 Vanadium,
53 Yttrium,
54 Zinc,
55 Zirconium,

Of these substances, all terrene compounds are formed. Most of these bodies are only capable of combining in certain undeviating proportions.

The character of the compounds formed from the union of some substances, vary amazingly, according to the proportions in which they are united; thus, atmospheric air and nitric acid are both formed from the union of oxygen and nitrogen, only those elements are united in different proportions.

The body of man, like all other compound substances, is made up of a certain number of these elements, united in definite proportions; generally, among healthy persons, there is a perfect correspondence, of chemical combinations, but this is not invariably the case, while other animals are incapable of living, except on confined zones of the earth's surface. Man is able to exist and propagate his species on every part of it, from the equator to the poles. The vast disparity of food and climate between these extreme points, causes a slight difference in the chemical composition of their bodies. Disease in some cases has been demonstrated to consist in a change in the chemical composition of the body. Thus in diabetes, sugar exists in the blood. In yellow fever, the salts which naturally exists in the blood, are either totally absent or materially reduced in quantity. In consumption and in albumenaria, there is an abnormal amount of albumen in the system. In gout, an acid vapor exudes from the skin, as is shewn by the reddening of litmus paper in its vicinity. In certain urinary diseases oxalic acid is found in the system, and many other diseases are characterized by the presence of substances, on the removal of which life and health are dependent.

In other diseases, chemists have hitherto been unable to detect any change in the chemical constitution of the body, but guided by analogy and by pathological indications, it is deemed by the most judicious physiologists fair to infer, that disease in general consists in a change more or less extensive in one or more of the tissues of the body.

Although the body may with sufficient accuracy for our purpose be considered as chemically unchangeable, yet the matter of which it is made, is momentarily changing. The man of to-day is not the man of yesterday, even when viewed as a mere mass of matter. The man who came from France during the war of the revolution to aid us in that conflict, and he who 1824 landed on our shores as the guest of the nation to behold our prosperity and growth, and to receive the warm and grateful homage of our people, was known by the same name and had one soul; but not a single particle of the body which came in the hour of our danger and our desolation was here to be the witness of our prosperity and our exaltation.

Every time we move a limb, and every time we think a thought, a number of particles of our muscles or brains are spoiled and rendered unfit for any farther use in the body; and the number of particles thus spoiled is in proportion to the energy of the muscular effort or the intensity of the intellectual action. Just so when we look at a landscape, or smell the perfume of a flower, or listen to the music of an oratorio, a certain number of the particles of these nerves which transmitted the view, the odor, or the sound, were rendered utterly unfit for the purposes of vision, olfaction, or audition.

By an ingenious (so to speak) provision of nature, machinery is provided by which these particles, as soon as they are spoiled are seized, and through various channels are ejected from the system. If this process were to continue long without repair, it is obvious that the body would very soon be totally disintegrated.

It is to repair this continual waste of the system, that the frequent reception of aliment is necessary.

But this is not the *sole* cause of its necessity. Warmth is a necessary element of human vitality, and food combined with oxygen in the lungs and in the capillaries is the agent employed in its production.

Since the human body is made up of certain definite chemical compounds, it is obvious that our food, with respect to quality, should contain all the elements which are contained in those compounds, and with respect to quantity, it should equal in amount the aggregate daily waste which occurs in the tissues and the calorific apparatus of the body. It is not so obvious, but experience has shown it to be equally true, that these elements must not only be presented to the body, but presented in certain mechanical forms, and in certain chemical conditions. Thus, kernels of wheat, if swallowed, contain the elements of many of the compounds requisite for the formation of the tissues of the human body, yet they would not sustain life for any lengthened period, unless they were comminuted by mechanical means.

Common salt is an aliment of the greatest value. It is composed of muriatic acid and soda. The former is the chief constituent of gastric juice, the latter is the basis of the solvent principle of the bile; yet it would not answer to give these substances separately; they must be taken into the stomach in combination, and afterwards decomposed by the wonder-working chemistry of the body. We cannot always assign a reason for these preferences of the digestive organs, but the fact of their existence is well ascertained.

Some of the elements of the human body exist in much greater abundance than others, and some are wasted much more rapidly than others, but there is not one of them which is not subject to waste sooner or later. And therefore no system of diet is perfect which does not contain every element of the body in such mechanical forms and such chemical condition as is best adapted for nutrition and assimilation. This has been confirmed by innumerable experiments. Sugar is very nutritive, but dogs confined to its use, with pure water for a drink, perished in about 32 days.* Fed exclusively on olive oil and water, they died in 36 days; and with gum and butter the same result was obtained. Fed with pure wheaten bread and water, they perished in 50 days.

Rabbits, or guinea-pigs, fed with a *single* substance, as wheat, barley, oats, cabbage, carrots, &c., will die within a fortnight, and sometimes much sooner; but if the same substances be given together, or after short intervals, the animals live and do well.

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* Magendie's Physiology, p. 483.

In all the articles of diet above mentioned, there was either a total want, or a great deficiency of azote, a substance which enters largely into the composition of the muscular, and other tissues of the body. To remedy this defect, gelatine, a compound in which azote abounds, was added to the bread, but it did not support life. It was necessary to add a small proportion of *ozmazone*, the substance which gives to meat its peculiar taste, before perfect nutrition was effected. This is the more singular, as ozmazone is a substance so minute in quantity, and so subtle in its nature, as hitherto to have bid defiance to chemical analysis.

A curious illustration of the narrowness of the line which separates deficiency of food from sufficiency, is afforded by the following account of an experiment tried at the Pentonville Prison. Fifty prisoners were fed for one month on the following diet, which gives the *weekly* allowance : meat, 28 ounces ; bread, 112 ounces ; soup, $3\frac{1}{2}$ pints; potatoes $3\frac{1}{2}$ pounds; gruel, 7 pints; cocoa, $5\frac{1}{4}$ pints ; molasses, $1\frac{1}{2}$ gills.

At the end of one month it was found that on this diet, 70 per cent. lost weight, 14 per cent. gained weight, and 16 per cent. remained at their original weight. The average gain was 1.21 pounds. The average loss was 1.75 pounds.

They were next allowed the following weekly diet: meat, 28 ounces ; bread, 140 ounces ; soup, $3\frac{1}{2}$ pints ; potatoes, 7 pounds ; gruel, 7 pints ; cocoa, $5\frac{1}{4}$ pints ; milk, 14 ounces; molasses, $1\frac{1}{2}$ gills. With this diet, 16 per cent. lost weight, and 58.66 per cent. gained weight; of those who lost weight, very few declined in strength, the loss being chiefly made up of adipose tissue, which rather improved than injured their condition. A comparison between the two tables shows an addition of 28 ounces of bread, $3\frac{1}{2}$ pounds of potatoes, and 14 ounces of milk weekly, made all the difference.

Since we have seen that all portions of the body are subject to waste, and that our food should be such as shall contain all the elements necessary for its repair, it becomes a question of great interest to know all the substances of which the body is composed. Most of these are contained in the blood, which, according to Le Cann, consists of the following substances :*

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* Copland's Dictionary of Medicine, Art. Blood.

	First Analysis.	Second Analysis.
Water,	780,145	786,590
Fibrine,	2,100	3,565
Albumen,	65,690	69,415
Coloring matter,	133,000	119,626
Crystalizable fatty matter,	2,430	4,300
Oily matter,	1,310	2,270
Extractive matter soluble in alcohol and water,	1,790	1,920
Albumen combined with soda,	1,265	2,010
Chloruret of sodium and potassium and alkaline phosphates, sulphates, and sub-carbonates,	8,370	7,304
Sub-carbonate of lime and magnesia, phosphates of lime, magnesia and iron, peroxide of iron,	2,100	1,414
Loss,	2,400	2,586

From the foregoing proximate analysis, we may infer the following as the essential constituents of the human body:

1. Carbon,
2. Hydrogen, 5. Phosphorus, 8. Chlorine, 11. Potassium,
3. Oxygen, 6. Sulphur, 9. Sodium, 12. Magnesium,
4. Nitrogen, 7. Iron, 10. Calcium, 13. Fluorine.

Alimentary principles are divided by Magendie into the azotic, and the non-azotic.* Dr. Prout divides them into four classes, viz: the aqueous, the saccharine, the albuminous, and the oleaginous.† But as Dr. Pereira justly remarks, these divisions cannot, without unwarrantably straining the language, be made to include all the articles which seem necessary for food.‡ He therefore adopts the very simple division of food into alimentary principles, and compound aliments.

Practically, if we give men enough of food containing carbon and nitrogen, we shall be pretty sure to feed them sufficiently; all food, having enough of these two elements, will be combined naturally, with all others that are necessary.

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* Human Physiology, p. 19.

† Stomach and Renal Diseases, p. 354.

‡ Food and Diet, p. IV.

As these two elements are of so much importance, I have given in the table marked F, the amounts of those substances contained in many of the most common articles of food.

Dr. Pereira, after dividing food into alimentary principles and compound aliments, subdivides the former into the following classes, viz.: 1st. The aqueous. 2d. The mucilaginous, of which gum is the representative. 3d. The saccharine, of which sugar is the representative. 4th. The amylaceous, which is represented by starch. 5th. Ligneous, represented by wood. 7th. Pectinaceous, represented by vegetable jelly. 7th. The acidulous, represented by vinegar. 8th. Alcoholic, represented by rum. 9th. Oleaginous, represented by sweet oil. 10th. Proteinaceous, represented by albumen. 11th. Gelatinous, represented by isinglass. 12th. The saline, represented by common salt.

We have already remarked that food is necessary for supplying heat to the body. That portion of the food taken into the system which contains *carbon*, is the portion which keeps up the warmth of the body. Whenever carbon and oxygen unite chemically, heat is disengaged; and the amount of heat disengaged by a given quantity is always constant. If the union takes place slowly, the heat is dissipated nearly as fast as it is engendered, and the temperature is not considerably raised; if, on the contrary, the union is accomplished rapidly, there is no time for the dissipation of the heat, and the temperature is considerably elevated; nevertheless, the absolute amount of heat generated is precisely the same in the one case as the other. If the carbon and oxygen are both surrounded by ice during their combination, whether they unite slowly or rapidly the amount of ice melted will be the same, which proves that the absolute heat engendered in both cases is alike.

Innumerable trials show that the heat of the body is the same, whether it is placed under the burning skies of the equator or the frigid regions around the poles. Since vastly more heat is necessarily radiated at the latter than the former, it is clear that a much greater amount of oxygen and carbon must unite chemically within the body. Accordingly, we find that persons living at the equator require less food than those within the polar regions. The most amazing accounts are given by travellers of good authority of the gormandizing powers of these races. Sir W. E. Parry*

* Second Voyage for the Discovery of the Northeast Passage, 1824.

says that as a matter of curiosity he one day tried how much food a young Esquimaux, scarcely full grown, would consume, if freely supplied. He eat in 20 hours the following articles, which were carefully weighed by Capt. P., and eaten in his presence:

	lbs.	oz.
Sea horse flesh, hard frozen,	4	4
Sea horse flesh, boiled,	4	4
Bread and bread dust,	1	12
	10	4
Rich gravy soup	$1\frac{1}{4}$ pts.	
Raw spirits,	3 wine glasses.	
Strong grog	1 tumbler.	
Water	1 gall. 1 pt.	

Capt. Cochrane* says, that one of Takuti consumed in 24 hours the hind quarter of a large ox, 20 lbs. of fat and a proportionate quantity of melted butter for his drink.

Admiral Sancheff, in order to test the truth of this statement, gave him a thick porridge of rice boiled down with 3 lbs. of butter, weighing together 28 lbs. Although he had already breakfasted, he sat down with great eagerness, and consumed the whole without stirring from the spot. By reference to table F, it will be seen that nearly ten pounds of pure carbon were thus consumed.

If we compare the quantity and quality of this meal with one which suffices for an inhabitant of the torrid zone, the contrast is most striking. I have no reliable account of the average quantity of food consumed by adults in those regions, but all travellers agree in stating that it is small in amount, and that is chiefly made up of vegetables and acid fruits.

We have thus seen how the appetite of persons, living in cooler regions, impels them to lay in a greater store of carbon than those living in warmer ones, and it will now be seen that a similar provision of nature impels them to inhale a larger quantity of oxygen also. Muscular exertion is necessary to quicken the action of the heart and lungs, and an increased amount of nitrogen is consumed in order to provide for the increased muscular action.

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* Narrative of a Pedestrian Journey through Russia and Siberian Tartary, 1825.

The total capacity of the chest is an unchangeable quantity; hence, when the air is of the same composition and of the same density, the quantities of oxygen inhaled at each inspiration are equal, but when the composition or the density, or both together, are changed, the amount of oxygen consumed will also vary in the ratio of these changes.

These changes are actually effected in practice; the air, like all other bodies, is dilated by heat and contracted by cold. If, for example, one cubic foot of air at the poles is expanded to two cubic feet at the equator, it is evident that there must be twice as many particles of matter at the former as at the latter, and at every inspiration twice as many particles of oxygen will be brought into contact with the lungs, and with the matters circulating through them, in the cold air as in the warm. Again, in a warm atmosphere there is a far greater abundance of aqueous vapor than in a cold one, which of course displaces so much of the oxygen and nitrogen of the atmosphere, and consequently increases the disproportion between the amount of oxygen furnished at each inspiration in the torrid and frigid zones.

These facts guide us to some important practical conclusions. From them we learn that food can, to some extent, be replaced by external warmth, and on the contrary, a deficiency of external warmth can be supplied by an increased amount of carbonaceous food; and that a diet which is amply sufficient for a southern institution, would be cruelly insufficient for the inmates of one farther northward.

Notwithstanding the foregoing demonstration of the importance of carbonaceous elements in our food, Liebig does not admit it as a real alimentary principle. His words are as follows*: "According to what has been laid down in the preceding pages, the substances of which the food of man is composed, may be divided into two classes: into *nitrogenized* and *non-nitrogenized;* the former capable of conversion into blood, the latter *incapable* of this transformation."

"Out of those substances which are adapted to the formation of blood are formed all the organized tissues. The other class of substances, in the normal state of health, serve to support the pro-

* Liebig's Organic Chemistry applied to Physiology and Pathology, pp. 95 and 96.

cess of respiration. The former may be called the *plastic elements of nutrition*; the latter, elements of respiration."

"Among the former we reckon,—vegetable fibrine, vegetable albumen, vegetable caseine, animal flesh, animal blood."

"Among the elements of respiration in our food are,—fat, starch, gum, cane sugar, grape sugar, sugar of milk, pectine, bassorine, wine, beer, spirits."

Acting on these views, tables have been drawn up to show the relative values of different articles of food, founded on the amount of nitrogen contained in each; and one of the prime objects I had in view, was to confirm or disprove these scientific deductions by the test of experience in the various prisons and alms-houses of the country. I have already recorded my failure to do so, because no observations had been made which would enable me to accomplish my purpose.

The following table of nutritive equivalents was constructed by Boussingalt, one of the most eminent organic chemists of the age, and would be of incalculable value if it were confirmed by practical experience.

BOUSSINGALT'S SCALE OF NUTRITIVE EQUIVALENTS.

Substances.	Equivalents.	Substances.	Equivalents.
Wheat flour,	100	Peas,	67
Wheat,	107	White haricots,	56
Barley meal,	119	Lentiles,	57
White garden cabbage,	810	Barley,	130
Potatoes,	613	Oats,	117
Ditto kept 10 months,	894	Carrots,	757
Ditto dried at 212°	126	Turnips,	1335
Rye,	111	Jerusalem artichokes,	539
Buckwheat,	108	Rice,	177
Horse beans,	44	Indian corn,	138

It must be carefully borne in mind, that these values are solely based on the power of each article for the re-production of the wasted tissues of the body. The immense requisitions of the respiratory organs are left wholly out of view. Bearing this in mind, it will be seen that according to this table, 757 lbs of carrots will afford as much repair for the wasted organs as 100 lbs.

of wheat flour; 1335 lbs. of turnips will be equal to 111 lbs. rye, &c.

Having thus explained the test which science offers for judging of the value of the nitrogenous compounds necessary for human nutriment, we procced to explain the test which science proposes for determining the amount of carbonaccous matters which are required for the purposes of the animal economy. We makc the explanation in the words of Liebig.* "According to the experiments of Lavoisier and Seguin, an adult man takes into his system from the atmosphere, in one year, 746 lbs., according to Menzies, 837 lbs. of oxygen; yet we find his weight at the beginning and end of the year, either quite the same, or differing one way or the other, by at most a few pounds.

What, it may be asked, has become of the enormous weight of oxygen thus introduced in the course of a year into the human system?

This question may be satisfactorily answered, no part of this oxygen remains in the system; but it is given out again in the form of a compound of carbon or hydrogen.

The carbon or hydrogen of certain parts of thc body have entered into combination with the oxygen introduced through the lungs and through the skin, and have been givcn out in the forms of carbonic acid gas and the vapour of water.

At every moment, with every expiration, certain quantities of its elements separate from the animal organism, after having entered into combination within the body, with the oxygen of the atmosphere. If we assume, with Lavoisier and Seguin, in order to obtain a foundation for our calculations, that an adult man receives into his system daily $32\frac{1}{2}$ oz. of oxygen, (46,637 cubic inches=15,661 French grains weight,) and that the weight of the whole mass of his blood, of which 80 per cent. is water, is 24 lbs. it then appears from the known composition, of the blood, that in order to convert the whole of its carbon and hydrogen into carbonic acid and water, 64,103 grains of oxygen are required. This quantity will be taken into the system of an adult in 4 days 5 hours. Whcther this oxygen enters into combination with the elcmcnts of the blood, or with other parts of the body containing

* Organic Chemistry, pp. 13–15.

carbon and hydrogen, in either case the conclusion is inevitable, that the body of a man, who daily takes into the system $32\frac{1}{2}$ oz. of oxygen, must receive daily, in the shape of nourishment, as much carbon and hydrogen as would suffice to supply 24 lbs. of blood with these elements; it being pre-supposed that the weight of the body remains unchanged, and that it retains its normal condition as to health.

This supply is furnished in the food. From the accurate determination of the quantity of carbon daily taken into the system in the food, as well as of that proportion of it which passes out of the body in the fæces and urine, unburned, that is, in some form in which it is not combined with oxygen, it appears that an adult taking moderate exercise, consumes 13.9 oz. of carbon daily. (See table G, and for calculations see Liebig's Organic Chemistry, pp. 284–288.)

These $13\ ^{9}_{10}$ oz. of carbon escape through the skin and lungs as carbonic acid gas.

For conversion into carbonic acid, $13\ ^{9}_{10}$ oz. of carbon require 37 oz. of oxygen.

Since no part of the oxygen taken into the system is again given off in any other form but that of a compound of carbon or hydrogen; since further, the carbon and hydrogen is supplied in the food; it is clear that the amount of nourishment required by the animal body must be in a *direct ratio to the quantity of oxygen taken into the system.*"

The contributions of men of science to the solution of alimentary questions which we have sketched above may be summed up as follows:

1st. The body is continually wasting its substance.

2d. Food is necessary to repair this waste.

3d. Food is also necessary to support respiration, and to sustain animal heat.

4th. The food must be sufficient in quantity and quality to repair the waste of the organs and tissues, and to sustain animal heat.

5th. The higher the external temperature is maintained, the less food will be required within certain limits.

6th. All the organs and tissues are elaborated from the blood.

7th. Therefore our food must contain all the elementary principles of the blood.

8th. The chief organic element of the blood is nitrogen.

9th. The chief supporter of the heat is carbon.

10th. The wasted organic elements are evacuated in the fæces, the urine and the sweat; the sum of the nitrogenized compounds contained in these, shows the sum of the same compounds which must be received in the food.

11th. Since oxygen and carbon unite in uniform proportions to form carbonic acid, the amount of oxygen absorbed into the system is a measure of the quantity of carbonaceous materials which must be received in the food.

Review of some of the Bills of Fare given in this Report.

We have already remarked the discrepancy between the amount of food allowed at the different institutions. If at each of them a careful record of the weights of the men had been made when they entered, and their weights at the end of three or six months, it would have given us the most valuable information, but I could only obtain it from two of them.

The very intelligent superintendent of the New York Alms House had carefully noted the weight of 288 paupers on their admission to the institution, and also their weight when they were discharged. It is a curious fact that every individual gained weight. The particulars, which were politely furnished me by him, will be found embodied in the following table, which shows the numbers committed for 2, 3, 4, 6 and 12 months, and the aggregate and average weight gained during each period, and the average monthly gain.

Number committed.	Period of committal.	Aggregate weight gained.	Average w'ght gained by each person.	Average monthly gain.
3	2 mos.	5 lbs.	2.5 lbs.	
133	3 "	355 "	2.6 "	0.87 lbs.
1	4 "	4 "	4.0 "	
81	6 "	392 "	4.8 "	0.80 "
10	12 "	99 "	9.9 "	0.82 "
288				

At the Maryland Penitentiary, 83 prisoners were weighed on admission, and six months afterwards they were again weighed, with the results noted below.

48 men gained 245 lbs., average gain 5 lbs., average monthly gain 0.83 lbs.

35 men lost 236 lbs., average loss 6.75 lbs., average monthly loss 1.12 lbs. Of the above 83, 49 were white and 34 were black.

Of the 49 white persons,

31 gained 155 lbs., average gain 5 lbs., average monthly gain 0.83 lbs.

18 lost 157½ lbs., average loss 8.75 lbs., average monthly loss 1.46 lbs.

Of the 34 black persons,

20 gained 155 lbs., average gain 7.75 lbs., average monthly gain 1.29 lbs.

14 lost 63 lbs., average loss 4.50 lbs., average monthly loss 0.75 lbs.

It will be seen from the New York table, that the rate of gain was tolerably regular. The average gain during the three periods of 3, 6 and 12 months, which were the terms for which the greatest numbers were committed, was $\frac{8.3}{100}$ of one per cent. The average monthly gain of those committed for 6 months was less by $\frac{3}{100}$ of 1 per cent., and the average gain of those committed for 12 months was less by $\frac{1}{100}$ of one per cent. This shows a gain as regularly progressive as could be expected, and also shows that their allowance of food was greater than they required.

I say it was greater, because the great body of the laboring classes do not obtain food enough to increase their weight, and I believe the united experience of all nations shows that it is a capital error to feed paupers and prisoners *better* than the corresponding class in society who rely on their own exertions for support. By doing so, you offer a premium to pauperism and vice, and destroy the spirit of independence and of self-reliance among the laboring classes, which is the most active spring of industry, and the surest guaranty they possess for their own elevation in society.

In our statement of the conclusions of science with respect to food, we showed that nitrogenized compounds served to support the muscular and other organized tissues of the body, and these portions of the food, if given in greater amount than the waste of those tissues, would go to increase their volume. We also showed that the carbonaceous portions of the food served to support the process of respiration, and if a greater amount of these compounds were digested than was required for that purpose, the surplus would be deposited in the cellular tissues as fat.

Now if we find, as in the case of the New York Alms House, that the paupers are increasing in weight, and therefore seek to make such reduction in their food as shall prevent it, the first practical question that presents itself is, shall we reduce the amount of carbonaceous or nitrogenous food?

The answer to this question will be: If the increase is in the organic portions of the body, diminish the nitrogenous aliments. If in the inorganic portions, diminish the carbonaceous aliments.

It will be seen from these answers that the question which we proposed practically resolves itself into another. Is the gain in the weight of these paupers caused by the increase of the organic tissues or the inorganic deposits? Both of these are indicated by the scales. We cannot determine, by simple weighing, which of the two are in excess. There may be methods of doing this of which I am ignorant. But the only method of discrimination that I am acquainted with, is to compare the amount of nitrogen in the food taken with the amount contained in the urinary and alvine evacuations. If the nitrogen received with the food exceeds the sum of the nitrogen contained in these excretions, we conclude that the increase is organic, and therefore lessen the amount of nitrogenized food. If, on the contrary, the two sums are equal, we content ourselves with reducing the carbonaceous aliments.

It will be easy for any one to ascertain the amount of nitrogenized compounds in any article of food, by a simple calculation founded on the statements in table F, annexed to the report, but to ascertain the amount of nitrogen in the excrements would require a greater amount of chemical skill, and greater delicacy of manipulation, than could be secured by the greater number of institutions in this country. It might, however, be done in New York, Boston, or Philadelphia, and I hope that it may be done in each of those places.

Experienced and well educated physicians are familiar with certain external signs, by which the deposition of fat, or organic tissues, can be approximatively ascertained. Guess-work is always less satisfactory than the severer determinations which can be expressed by weight and measure; but if this point were carefully attended to by physicians attached to our public institutions, much good might be done. Hitherto they have given little attention to the subject. From the examination I made at the New York Alms House, I am inclined to believe that the increased weight was chiefly organic, but my information is too imperfect to allow me to offer anything beyond conjecture.

In table H, I have endeavored to calculate the amount of carbon and nitrogen contained in the bills of fare of the institutions mentioned in the table. The amount of food given in each is exhibited in table A, and must therefore be vitiated with the ambiguities of the table. From most of the places visited, I could only obtain the weight of meat including bone. And from many, I could only obtain the amount of meat purchased weekly, with the number of persons of all ages fed during the week, including those of all ages from infancy upwards. I have therefore calculated the meat as though the bone yielded as much carbon and nitrogen as muscle, and watery potatoes as though they contained as much carbon as mealy ones. There is in reality less difference between the amount of carbon and nitrogen consumed, than appears from the table, from the fact that the Emigrant Refuge at Ward's Island has a greater proportion of nursing infants than the Alms House at Providence, yet these infants were estimated in calculating the weekly consumption; though they do not immediately consume, their proportion is consumed by the adults, and therefore they actually consume so much more than appears from the table. Nevertheless, with all these sources of error, (to which I must add my own want of practice in such calculations,) the table will be found useful as an approximation towards the truth.

On comparing the weight of nitrogen and carbon consumed at the New York Alms House in a week, with the weights of those articles consumed at the other Alms Houses, as given in table H, it will seem that it stands at the head of the list. It exceeds the Providence Alms House, which is next to it in the consumption of

nitrogen, by 4.04 oz.; and it exceeds the Baltimore Alms House, which stands next to it in the consumption of carbon, 13.54 ounces. It exceeds the Alms House at Washington, which stands lowest on the list, by 8.37 ounces of nitrogen and 34.40 ounces of carbon.

On comparing of these elements, as given in the tables, it will be seen that there is a tolerable approximation to uniformity among the Alms Houses, and among the Prisons, and that there is a wide difference between the Alms Houses and the Prisons, the diet in the latter being much fuller than in the former. To this uniformity among the Alms Houses, that at New York forms an exception; its diet is a prison diet, and as it exceeds all other Alms Houses in the amount of food, and as the uniform increase of weight among its inmates shows that they receive more than sufficient to repair the waste of the system, and as the fare is better than that enjoyed by the self-sustaining poor in the vicinity, I think it is clear that it may be safely reduced.

The table also shows that, with the single exception of the Massachusetts State Prison, the Penitentiary at Blackwell's Island has the most liberal allowance of food of any prison mentioned in it. I had much conversation with the Superintendent and Clerk, in relation to the food of the prisons, and they were both very sure that the prisoners left there in very much better condition than they entered; in many cases, they assured me, the prisoners who were discharged could scarcely be recognised by their old acquaintances, so greatly had they increased in bulk; and the Warden of the Massachusetts Prison, that his prisoners were almost invariably discharged in a similarly improved condition. I cannot doubt that the allowance of food at both these prisons is unnecessarily large.

The bill of fare at Pentonville, which is given in this Report,* has been used there since 1844, and has been found amply sufficient to keep up the health and strength of the men, all of whom are kept at hard labor. One hundred men on this diet, for one month, showed the aggregate weight of the men considerably increased. We have also seen that at Baltimore eighty-three men gained nine lbs. in the aggregate. These facts also concur in showing that

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* Page 12.

the food at the Penitentiary is unnecessarily abundant; still, it would be more satisfactory if we could have the weights of the men at the periods of their commitment and discharge. The diet at Ward's Island corresponds very nearly with the average of other institutions of a similar character, and, on the whole, seems judiciously adapted to the requirements of that institution.

Of the Consumption of Food in Families.

It would be very desirable, for the purposes of our inquiry, could we ascertain the exact consumption of food in private families, where each member was free to consult his own appetite; and also the consumption in those families where poverty interposed a bar to the full satisfaction of the appetite. Could we ascertain these facts with accuracy, we should be supplied with the maximum and minimum of alimentary necessities.

But like all the other branches of this inquiry, it is very difficult to obtain authentic information in relation to it. Very few persons keep a record of their consumption, and of the few who do so, still fewer will permit the public eye to gaze on these memorials of their private expenditure.

In Porter's "Progress of the Nation," p. 104, the consumption of a London family is stated as follows. The family consisted of a gentleman, his wife, six children and ten servants, in all eighteen persons.

	Per diem.	Per annum.
6668 lbs. meat, or, for each person,	1.0149.16 lbs.	370½ lbs.
5100 lbs. bread, " "	0.776.255 "	283⅓ "
541 lbs. butter, " "	1.317.505 oz.	30 1/20 "
1887 quarts milk, " "	28.721 qts.	104⅞ qts.

My own consumption, as nearly as I can ascertain it, is as follows, with a family consisting of three adults and three children:

	Per diem.	Per annum.
625 lbs. meat, or, for each person,	0.285 lbs.	104.725 lbs.
1600 " bread " "	0.730 "	266.450 "
1800 " potatoes " "	0.821 "	299.665 "
158 " sugar, " "	0.072 "	26.333 "

The English Poor Law Commissioners made very careful inquiries into the consumption of food in the families of the laboring poor, and it is indeed surprising to find on how little they appear to subsist. Assistant Commissioner Hale* says: "It was almost impossible in many districts to prescribe a diet less abundant, and of inferior quality to that of a majority of the laboring classes, and at the same time sufficient to keep the inmates of the work-house, belonging to the same classes, in health and strength." "It is a matter of notoriety, that meat is rarely, if ever, tasted by the Irish peasant." According to the minute personal inquiries of Assistant Commissioner Hawley, it appears that the food of the laboring poor, in thirteen Unions, consists of $9\frac{3}{16}$ lbs. of potatoes, and $2\frac{3}{13}$ pints of milk per day. These weights are of potatoes in their raw state; they lose in cooking about two ounces to the pound. The amount of nitrogen contained in this amount of potatoes and milk, for one week, is 5.62 ounces, and the amount of carbon is 132.10 ounces, which shows that men can subsist at hard labor, with a less amount of nitrogenous food than is allowed to the idlest pauper in this country, and may probably be considered the minimum supply for a laborer.

In the first annual report of the American Prison Discipline Society, p. 14, we are told that in 1822, the directors of the Millbank Prison, containing eight hundred prisoners, in compliance with a popular demand for severe punishments, reduced their diet to eight ounces of bread per diem, and a soup made in the proportion of one ox head to every hundred male prisoners, and the same to one hundred and twenty females. This amount of food, for one week, gives 20.41 ounces of carbon and 3.24 of nitrogen.

"A general decay of health was apparent, but the scurvy did not appear till January, 1843. The cases of disease increased rapidly, and on the 28th of February, 118 were sick, and on the 10th of April, more than 400."

I have no doubt, however, that they might have been kept in tolerable health, even with this small supply of nitrogen, had the supply of carbonaceous food been increased sufficiently to supply the waste from respiration.

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* Sixth Annual Report Poor Law Commissioners, p. 238.

Of Various Articles of Food, and the Influence of Cooking on their Value as Aliments.

Bread has been called "the staff of life," and the appellation is as just as it is poetical. No single article of food is so well adapted to satisfy the cravings of appetite, and to repair the waste of the system. Yet, alone, it well not sustain life.

It seems to have uniformly sustained its popularity wherever it has been introduced, and those who have been instrumental in its introduction, among nations to whom it was previously unknown, have ever been regarded as public benefactors.

According to a tradition of the Jews, Eve was the first inventress; the legend assures us that our prime mother was wont to heat small flint-stones beneath the leafy bowers of Eden, which she deposited in an earthen pitcher; then she poured semi-fluid dough into it, which percolated through the stones, and adhered to their surfaces; when the pitcher cooled, she carried it to the side of a clean rivulet, and seated herself by Adam's side; the bread was then scraped from the sides of the stones, when they eat it with the fruits plucked from the loaded boughs above them, and clear water from the brook in place of tea and coffee. There is certainly some beauty, if no truth, in the legend.

The earliest authentic intimation of the use of bread is found in Genesis xiv, 18: "And Melchisedec, king of Salem, brought forth *bread* and wine." The chronology of this is fixed by Dr. Hales at A. M. 2091.

The first notice of leaven and leavened bread is found in Exodus xii. 5: "Ye shall put away leavened bread out of your houses: for whosoever eateth leavened bread from the first day until the seventh day, that soul shall be cut off from Israel." The date of this prohibition was A. M. 2513, or 422 years after bread was first mentioned. As nothing is said of leaven previous to the exodus, it is probable that the Hebrews learned its use from the Egyptians.

According to a Chinese tradition, Ching Noung, the successor of Fohi, was the first who taught men (Chinese) the art of husbandry and the method of making bread from wheat, and wine from rice, B. C., 1998.

There was an annual festival celebrated at Athens, and the various cities of Greece, in honor of the hero who first taught them

the art of bread-making, previous to which their food had been roasted acorns. One of the facts most clearly ascertained with respect to the economy of public institutions, is, that they should always bake their own bread. It can always be done cheaper and better than it can be purchased.

There is always a great temptation for the baker to adulterate his bread. There are many modes known to the trade, by which its weight may be increased without addition to its nutritive qualities. For example, if thin flour paste is used instead of water for setting the sponge, 104 loaves, of 4 lbs. each, can be made out of the same flour, which otherwise would only make 94 loaves, because the boiled paste communicates a water-keeping faculty to the bread in that proportion. Another common practice is to add sulphate of copper to the dough; a single grain added to three pounds of bread will increase its weight by a full sixteenth.

But bread may also be baked *cheaper* than it can be purchased; this is the uniform testimony of all the institutions I visited, except one or two which took the stale and refuse bread of the bakers at a reduced rate. At the work-house on Randall's Island, 1,490,562 lbs. of bread were baked from 1,135,428 lbs. of flour, and some additional Indian meal; the increase of the weight of the bread over the flour and meal used in its composition was about 30 per cent. The bake-house has five ovens, each of which is heated three times a day, making 15 heatings per day, and 90 heatings per week; these 90 heatings consume two cords of pine wood; each heating will therefore consume $2\frac{3}{4}\frac{8}{5}$ feet of wood. Two pounds of salt and four quarts of yeast are used for a barrel of flour. The average cost of each loaf is 6 cents, or 2 cents per pound.

The average increase of the weight of bread over the flour, used in its composition, is 33 per cent. in our best public institutions.

It ought to be known that there is a wide difference amongst the different kinds of flour sold in the market, with respect to bread-producing qualities. This will be clearly indicated by the following table, kindly furnished me by Dr. Bell, of the McLean Lunatic Asylum at Boston, as the result of carefully conducted experiments at that institution.

1 bbl.	of	Canal flour	produced	290 lbs.	of bread
"		J. H. Beache's brand	"	from 300 to 329 lbs.	"
"		W. Whiting's	" "	" 300 " 310	"

1 bbl.	E. S. Beach, Akron brand	produced	310 to 315	lbs. of bread.
"	Shawmut	"	290 " 300	"
"	C. J. Hill	"	276 " 285	"
"	J. Field, Rochester	"	300 " 305	"
"	Lockport Mills, A. Spaulding	"	310 " 315	"
"	Akron Cascade	"	295 " 300	"
"	Union steam mills	"	230 " 250	"
"	Franklin, Ohio	"	232	"
"	Richmond	"	233	"
"	Eagle Harbor	"	295 to 300	"
"	Common Genesee about		275	"

When we bear in mind that, with the flour purchased by the greater number of institutions, only 261 lbs. of bread are obtained from a barrel of flour, the importance of skill and knowledge in the purchase of flour becomes strikingly apparent.

The difference between this amount, and the quantity of bread yielded by a barrel of J. H. Beache's flour is 68 lbs., which, at 2 cents per lb., is $1 36½ per bbl. Hence, on 5,793 barrels, (the number purchased in a year by the ten governors,) there would, at an equal price per barrel, be a saving of $7,878 48. It is undoubtedly better in many cases to purchase supplies on a large scale by contract, but flour can always be more economically procured in the open market.

It is invariably true, that the excellence of bread will be in the exact rates of the weight obtained from a given quantity of flour. The excellence and the nutritive properties of flour depend very much on the amount of *gluten* it contains; and it is found, on analysis, that different kinds of wheat vary greatly in the amount of this substance contained in them. Thus, according to the analysis of Vauquelin.

Flour from the hard wheat of Odessa contains 14.55 per cent. of gluten.

Used in French hospitals, 9.02 per cent. of gluten.

Hence, a barrel of the Odessa flour will contain 10.85 lbs. more of gluten than a barrel of French flour.

Since a knowledge of the amount of gluten in flour is so necessary for those who purchase it, it is desirable for them to know how to analyze it. For this purpose he should weigh accurately 1 lb. of flour, and place it on a piece of silken sieve stuff; it is

then to be washed with pure water on the sieve, until it ceases to be milky; the sticky mass which remains on the sieve is gluten. After being carefully dried and weighed, it will show the amount of gluten contained in a pound of flour. The comparative chemical and commercial values of different samples of flour can be ascertained in this way, with sufficient accuracy for common purposes.

The various processes of bread-making are, first,

Setting the Sponge.—A sufficient quantity of salt (about 2 lbs. to a bbl. of flour) is dissolved in lukewarm water; yeast (about 4 qts. to a bbl. of flour) is then added, and flour enough to give it a semi-fluid consistency is carefully stirred into it. It is then set aside to rise. In about an hour carbonic acid gas begins to form, and very soon the sponge begins to swell; if too little flour has been added, or the sponge is too thin, the gas breaks through and escapes; if too much flour has been added, or the sponge is too thick, the gas does not permeate the whole mass, and it becomes unequal. Second,

The Kneading Process.—After a sufficient amount of carbonic acid gas has been developed in the sponge, more flour is incorporated with it by a laborious and long-continued kneading, so that every part of the flour shall be thoroughly moistened, and the gas generated in the sponge shall be brought into contact with every portion of the added flour.

It is then set aside to rise again, when an additional development of gas ensues at the expense of the sugar of the freshly added flour. When it has risen enough it is again kneaded, and separated into lumps which are formed into loaves; these are set aside until they about double their bulk, when they are ready for, Third,

The Baking Process.—The oven is heated to the proper degree, which every baker learns to judge of by the color of the oven, and the bread is then placed in it until the gluten and starch of the flour are chemically incorporated, which is the case when a straw thrust into the loaf can be withdrawn without the adherence of any glutinous matter. The bread is then withdrawn from the oven and is ready for use.

Having thus described the various processes of bread-making, let us inquire into the part which is performed by the various ingredients in the compounds, and the processes performed for its production.

The presence of *salt* in bread is for the following uses: first, if the the flour is slightly damaged, it will correct it. Second, it makes the bread far more agreeable to the taste. Third, by its affinity for water, it prevents the bread from drying up, as it would do without it. Fourth, its anti-seeptic properties prevent the bread from moulding; and fifth, its affinity for water is so great, that much more of that liquid can be used in the bread.

The function of *yeast* is, by inducing fermentation, to produce that spongy and vesicular texture which is essential to good bread. In order to explain some of the principles of fermentation, we must understand, that when animal and vegetable substances are divorced from the vital principle which held them by a peculiar and unknown force in a fixed condition, there is a tendency in them to re-arrange their particles in such a manner as to be fitted to re-enter a living animal or vegetable body, in other words, they begin to decay. Those substances which contain much nitrogen in their composition, and of which the gluten of wheat is an example, are conspicuous for the looseness of their union with those substances with which they combined in the living plant or animal.

Nitrogen, indeed, is remarkable for the feebleness of its affinity with all the simple substances, and seems to require the vital force superadded to that attraction, in order to remain in stable combination with them. In the progress of nitrogenized bodies towards decay, several successive stages are clearly discernable, and these succeed each other in a regular and unvarying order.

Fermentation is one of these stages. Wheat contains gluten, starch, and sugar; the former being rich in nitrogen, is united to the other bodies by a very feeble tie, but a separation is prevented by the vital power resident in the vegetable. Grinding destroys the vitality of the wheat, and hence the power which contains its proximate elements in combination is very much enfeebled. In general, chemical transformations cannot take place without the presence of water; hence we see the necessity of forming flour into lough by means of water in order to insure the requisite fermentation. In this condition the elements of flour are held together

by the feeblest possible affinity—they are in a state of unstable equilibrium—like a pile of bricks, which, while perfectly still, may stand safely, yet may be thrown down by the slightest touch.

This slight touch is in fact communicated by the yeast; it exercises no chemical action on the dough, its mere *presence* accomplishes the work. Being itself in the act of transformation, it at once gives the necessary force to set the elements of the dough at liberty; and that chain of causes is commenced, which eventually fits the material particles of the flour to re-enter the living vegetable.

The sugar of the dough is first acted upon, and quitting the form of sugar, is resolved into carbonic acid gas and alcohol.

Sugar, carbonic acid, and alcohol, are mutually convertable into each other, being formed of the same elements united in different proportions.

Sugar is composed of twelve equivalents of carbon, twelve o hydrogen, and twelve of oxygen. Alcohol is composed of four equivalents of carbon, six of hydrogen, and two of oxygen; and carbonic acid is composed of one equivalent of carbon and two of oxygen. Yeast, then, by its presence, disposes the sugar to transpose its elements and thus from these compounds is the carbonic acid formed at the expense of the sugar, which forms those numerous air cells on which the lightness of bread is dependent.

We may remark in passing, that the baker sometimes is unable to make his dough rise well, even when the whole process is skillfully performed, this defect arises from the absence of sugar in the flour; and may easily be remedied by adding about three ounces of sugar to fifteen or twenty pounds of flour.

Kneading.—The end to be accomplished by the repeated and laborious kneadings to which the dough is subjected is, to bring every particle of the fermenting mass into contact with every particle of sugar dispersed through the dough. This would be obviously impossible, were the small quantity of yeast required for a batch of bread, poured immediately into the large mass of flour.

A small quantity of flour only, would combine with the yeast, and therefore only a small portion of the batch would be spongy, the rest being tough and clammy. But by first incorporating the yeast with the semi-fluid sponge, it is easily diffused through it; a portion of the gluten of the flour is during the process, endowed

with the property of yeast, that is, acquires the property of decomposing sugar.

When, therefore, the reserved flour is added to the sponge, it encounters a prodigiously increased number of particles which are endowed with the power of promoting fermentation.

The kneading the sponge with the flour should be effected as evenly as possible, so that every particle of flour should be brought into contact with the sponge, when carbonic acid gas is developed throughout the mass.

Baking.—We have already shown the tendency of nitrogenized bodies to decay through a regular and unvarying series of gradations; and we have traced the process up to the point where the sugar is converted into alcohol and carbonic acid gas. We have now to remark, that as soon this transformation is effected, another commences, which is called the acetous fermentation, by the operation of which, the above named substances are converted into vinegar. It is the object of the baker to check the fermentive process as soon as the sugar of the flour is converted into carbonic acid gas, and *before* the formation of vinegar is effected. This is most effectually accomplished by baking, since fermentation is arrested at a temperature over 120° F.

We have seen also that alcohol is engendered during the fermentive process. As this poisonous substance was never intended by the Creator for the sustenance of man, it is necessary, if we would have wholesome bread, to get clear of it. Baking fulfills this indication. An oven sufficiently hot for baking properly, will distil off all the alchohol in the dough, and when a straw thrust into the centre of a loaf comes out again without the adherence of the dough, it is a sign that the last drop of alcohol has departed from it, and that the bread is ready for the stomach.

Baking contributes in other ways to the perfection of bread. Notwithstanding the original sugar of the flour is converted into carbonic acid gas and alcohol, yet on analysing well made bread, we find that there is more sugar in the baked loaf than there was in the flour; this anomalous fact was for a long time very puzzling to chemists, but it is now clearly ascertained, that the starch of the flour is converted into sugar by the action of the gluten upon it during the process of baking. Lastly, baking causes the gas to

expand, and this increases the division of the particles of the bread, making it far more palatable and light than it otherwise would be.

From what has been said, it appears that the conditions on which the making of good bread depends are as follows:

1st. Flour rich in gluten and sugar.

2d. Lively yeast.

3d. The temperature of the sponge should be kept from 68° to 77° F. Fermentation will not go on below 60°, and a temperature higher than 120° F. arrests it.

4th. Thorough kneading; care being taken not to break the dough, since that permits the escape of the gas.

6th. To check the fermentation by baking before the developments of acetic or lactic acids commences.

7th. If these acids are accidentally formed before baking, to neutralize them with soda or some equivalent alkali.

It was with no little surprise that I found that *white* bread was always used in the various institutions of our country. I consider this is as a mistake. There is much nourishment contained in the rejected portions of the wheat, and certain salts have their seat in the inner coating of the envelope of the grain which contribute very much to the healthfulness of the body.

I would strongly recommend that what is called Graham bread should be used in every prison and almshouse in place of white bread. I believe the change is loudly called for by every economic and hygenic consideration.

I do not know the price of Graham flour, but it is evident that it must be much lower than superfine flour, because 6,000 lbs. of wheat yield but 4312 lbs. of superfine flour, showing a loss of 1,688 lbs. of nutritive matter.

The time required for the chymification of Graham bread is 3 hours 30 minutes.

Corn Bread deserves more attention than it has yet received from the managers of prisons and almshouses.

It is used at very few places that I have visited, and forms the staple of no institution except the Washington almshouse, where it is used. It is much approved, and seems a very agreeable and nutritive diet. The mode of making it is as follows: 3 bushels of meal are scalded in the morning, and left to soak until 3 o'clock, P. M.; a quart of fine salt is then added, and well stirred into the mass, after which it is placed in pans about $1\frac{1}{2}$ inches thick, and baked, a little practice will show the proper heat of the oven, and the time of baking.

The time required for the chymification of corn bread is 3 hours 15 minutes.

There is yet another kind of bread used at the Massachusetts State Prison, and at several of the New England almshouses, which is very cheap and nutritious, and which might be usefully provided occasionally as a change. It is made as follows:

8 bushels of rye flour are mixed with 8 bushels of Indian meal, by sifting alternate layers into a trough; a portion of the mixture is made into a sponge with 6 quarts of yeast. After the sponge has risen sufficiently, the remainder of the mixture is incorporated with it, and the dough, without waiting for any further raising, is then put into sheet iron pans 1 foot in diameter, and 4 inches deep. The loaves are baked for six or seven hours, at the end of which time they are swelled to about six inches in thickness. The size of the dishes is of some importance, as if they are smaller than above described, the loaf is too much dried to be palatable, and if larger, the middle of the loaf is not sufficiently done. When this bread is given exclusively, as it is at the Massachusetts State Prison, the daily ration is $2\frac{3}{4}$ lbs. In the heat of summer when wheat bread is given to the prisoners they are allowed $1\frac{1}{4}$ lbs daily.

Mush and molasses is an important article of diet in very many of the institutions which I have visited. There is however, a great discrepancy in the accounts I received of its nourishing properties and its healthfulness. It was complained of as producing diarrhœa at the Penitentiary on Blackwell's Island, the Almshouse and State Prison at Philadelphia, while at other places it was deemed a most valuable article of diet. I was much puzzled with these contradictory accounts at first, but the difficulty was explained by C. Robbins, Master of the House of Correction at Boston.

This gentleman has held the office since 1833, and he has been a close observer of the effects of food on the health of his prisoners during this long period. At first he found that mush disagreed with his men, but close observation showed him that this result did not arise from any inherent quality of the meal, but from improper cooking. It will be found on close examination, that the particles of Indian meal are hard and gritty, and that they do not readily absorb water. If these unsaturated particles are received into the stomach and bowels without being thoroughly saturated with water, the vital and chemical processes of digestion cannot act upon them, and they therefore irritate the mucous membrane as foreign bodies, and produce diarrhœa and dysentery. To obviate this, the meal should be soaked in cold water for 4 hours, then boiled 3 hours, at the end of which time, enough molasses is added to give ½ gill to every man to be supplied. The mixture is then boiled another hour, when it is finished. Mush cooked in this way will not injuriously affect the bowels when in a healthy state. Three ounces of meal per man is a sufficient ration.

The following analysis of Indian meal was made by J. H. Salisbury, chemist to the State Agricultural Society, and is considered by competent judges to be the most reliable statement of its composition on record :

Sugar and extract,.....	13.32	Oil,.....	4.60
Fiber or Epidamus,....	0.89	Matter separated from	
Zeine or gluten,.....	3.68	gluten by a weak solu-	
Albumen,.....	4.29	tion of potash,.....	5.97
Dextrine,.....	3.26	Caseine,.....	0.08
Starch,.....	56.30	Water,.....	8.45

Rice.—I have never heard any complaint of rice as an article of diet; in many places boiled rice is alternated with mush with great advantage. In point of cheapness, it does not compare with Indian meal.

Indian meal, according to the above analysis, contains 35.15 per cent. of carbon, and 1.27 per cent of nitrogen, while rice contains 34.10 per cent of carbon and 0.57 per cent. of nitrogen. Rice costs $2 50 per 100 lbs., while Indian meal costs $1 50 per 100 lbs. Thus while rice costs 70 per cent. more than meal, it contains less of carbon and considerably less than half the nitrogen.

Beans, as an aliment, are unequivocally condemned by the superintendants of many institutions, and are as highly praised by others; as an evidence of the better reliance that can be placed on the opinions of even intelligent officers when unsupported by reliable data, I may observe that the physician of the alms house at Blackwells Island was very certain that the days on which beans were eaten, were marked by extraordinary complaints of colic pains and diarrhœa, while the superintendant never heard of such complaints, and believes that beans were as wholesome an article of diet as any other vegetable. At my request, he paid particular attention to their effects subsequent to my visit; and has since been kind enough to inform me by letter that his opinion remains unchanged with respects to their wholesomeness.

I, however, met with this complaint too often to doubt that there is some foundation for it, but I have reason to believe that it arises, like the complaint against mush, from insufficient cooking. The external envelope of the bean is very tough and fibrous; if this covering is not reduced by cooking, it will act on the stomach and bowels as a foreign body, and an irritant. I have been assured by old soldiers, that when dried beans are eaten on a *hurried* march, when there is not time to soak them well before boiling, the ill effects were almost immediately made manifest by disorder of the bowels, but if they were soaked in water over night, and well boiled the next day, no such mischief was ever produced. This preliminary soaking should never be neglected in an alms house or a prison.

Time of chymification of boiled beans, 3 hours.

Beans contain 38 per cent. of carbon and 3.47 per cent. of nitrogen. This great richness in nitrogen would seem to indicate a high nutritive value, higher than practical experience has rated them, although I am sorry to say I can produce no reliable data for the foundation of such experience.

Potatoes are well known to be a valuable article of food, but their scarcity and high price of late has very much diminished their consumption in the prisons and alms houses of this and other countries.

Potatoes vary exceedingly in their nutritive qualities, some varieties being twice as valuable as others. The test of their value

is the amount of starch which they contain. Their value is also very much affected by cooking. In the Fifth Report of the Inspectors of Prisons for Scotland, Northumberland and Durham, is an experiment to ascertain the relative values of roasted nd boiled potatoes. In the first case the dinner consisted of 3 lbs. of boiled potatoes, and in the second, it consisted of 3 lbs. of roasted potatoes, the diet was the same in all other respects in both cases. At the end of the experiment, after two months trial, it was found that all the prisoners were in good health, and had gained on an average 4 lbs. each. One prisoner only lost weight, amounting to 5 lbs. 2 oz. The greatest gain was 9 lbs. 4 oz. This was on boiled potatoes. On the roasted potato diet the men were in good health, but there had been an average loss of $1\frac{1}{2}$ lbs. weight. The greatest loss was 10 lbs. by a man. The greatest gain was $6\frac{1}{2}$ lbs. by a woman. From this it appears that potatoes are more nutritive when boiled than when roasted; but the experiment deserves careful verification.

By the action of boiling water, the albumen is coagulated while the starch absorbs water, and swelling up separate from each other. When this process is well performed, the potato is said to be *mealy*, if not well done they are said to be watery. Late in the season, the water dries out of the potatoe, and a still larger quantity is extracted when germination begins. In this state i appears waxy and dark colored, when boiled. This condition is much improved by soaking the potatoes in water an hour before boiling. The lost water is regained, its dark color is diminished, and the flavor is much improved. Salt is added to the water at some alms houses, but this injures the color without being of any advantage. J. S. Holloway, the excellent warden of the Eastern Penitentiary at Philadelphia, writes as follows with regard to substitutes for potatoes:

"The beans, rice and homminy, &c., are served alternately, and have been resorted to as a substitute for potatoes during the late and present high price of that article. When abundant, or not over 50 cents per bushel, we serve them nearly every day at dinner, varying by an occasional mess of beets, parsneps, turnips, &c." "We do not use Indian meal in any other form than homminy, and that once a week."

Soup is considered as the alimentary sheet anchor by most Wardens, Superintendants and Physicians of public institutions, nevertheless, some are greatly opposed to it. Dr. R. A. Given, the very intelligent physician of the Eastern Penitentiary of Philadelphia, is most decidedly of opinion, that it is exceedingly injurious. It is not used at that penitentiary at all, its place being supplied by a hash composed of chopped meat, potatoes and onions heated together. I am however of opinion, from very careful enquiries, that it well deserves its popularity. Officers of public institutions are more divided with regard to the use of cabbage in soup, and I should not feel myself justified in recommending its use, believing that it is more indigestible when boiled in soup than in any other form of cookery. It is far more wholesome eaten raw.

The chemistry of soup-making is not well understood. We know that by some unknown play of affinities *Osmazome*, a sulphuretted compound, *ammonia* and two volatile acids similar to acetic and butyric, are produced.

The fibrine of the meat is rendered harder by the boiling, and yields nothing to the soup. Albumen is rendered soluble by the boiling, and contributes to its nutritive qualities.

The cellular tissues, the aponeurosis, the tendons and the bones yield gelatine, a substance rich in nitrogen.

By the usual methods of cooking, much gelatine remains undissolved in the bone, which might be extracted if boiled at a higher temperature. This has often been done in Europe, but the high price of fuel here forbids the economical use of the method.

Soup is best made as follows: 1 gall. of water, 4 lbs. of meat, 3 oz. of rice, $\frac{1}{2}$ lb. of vegetables, $\frac{1}{10}$ of pepper, $\frac{1}{20}$th of a gill of salt boiled for four hours together with the crumbs of bread left of the preceding day.

Kitchen and Cooking Utensils.

I have seen no kitchen which equals that at Ward's Island. The only objection to it is the want of contiguity to the dining room. It contains the following apparatus: Two ranges made by Wm. Beebe & Co.; 9 boilers of 80 gallons each, of Hoe's patent. These are double and are surrounded by steam, the outer vessel is encased in wood to prevent radiation. These are very superior to those into which the steam is directly admitted. With the latter

it is impossible to cook mush or beans, or even soup as they should be; with the former much more gelatine is extracted from the bones than with the latter; and with a pressure of steam of 25 lbs. to the square inch they can bake bread nearly as well as an oven, the spent steam can be employed in heating the building, or warming water for washing.

2 tea or coffee boilers. These are made of copper, 2 feet 4 inches long, 1 ft. 7 in. wide, and 2 ft. 2 inches deep. Each of these is surmounted by a copper globe 10 inches in diameter, formed by the union of two semi-spheres; a metallic diaphragm finely perforated, is extended across one of these, on which the tea or coffee is placed. Boiling water is now admitted into the globe through a stop-cock from a vessel above; after being left for some time with the coffee, a stop-cock in the bottom is opened and the liquid passes into the cistern beneath. This process is repeated until all the strength of the coffee or tea is exhausted.

For washing dishes a long trough runs along the side of the room which is divided into convenient compartments, a steam pipe runs along the bottom of the troughs and a cold water pipe runs along the top, furnished with cocks opening into each compartment of the trough. The steam may also be admitted or excluded at pleasure into either, or all the compartments. There is a row of shelves over the trough, separated from each other by the diameter of a plate; the space between the shelves is divided into spaces about $2\frac{1}{2}$ inches wide by means of wires perpendicular to the shelves; after the dishes are washed in the trough, they are put edgewise on the shelves between the wire racks to drain. The boiler in which the steam is generated is 12 ft. long and 3 ft. in diameter. It consumes 600 lbs. of coal per day, and besides heating the 9 boilers and the water for washingthe dishes, it warms several apartments of the building; but the number of cubic feet heated I did not ascertain. Such a kitchen and apparatus is sufficient to perform the cooking for 3,000 persons. There is no oven specially constructed for roasting meat. Though roast meat should not ordinarily be given as an article of diet to paupers and prisoners in good health, yet it is desirable that they should have it occasionally sometimes as a reward for general good conduct, and on some of the great festivals when all desire that the poor and even the guilty should participate in the general rejoicing. I saw an oven well

fitted for this purpose at the Boyleston Reform School at Boston, made by D. Sandford & Co. which seemed to me to be as good as can be made, and I would recommend its adoption.

Dining Rooms, and Dining Room Furniture.

The construction of dining rooms, and the adaptation of the furniture to the wants of Prisons and Alms Houses has occupied much of my attention. From my own observations and from consultation with experienced men, I have arrived at the following conclusions:

For Almshouses on a large scale, there should be four dining rooms, two for men and two for women. One room for each sex should be devoted to those, who from accident or unavoidable misfortune have been reduced from comfortable circumstances to poverty; every consideration of religion and humanity requires that such as these should be made comfortable. It would not be desired or expected that they should be maintained in luxury, but all that is included in the word comforts, should be theirs. I noticed with pleasure, at the Philadelphia Almshouse, a table spread for this class, with a clean white cloth, white earthen plates, knives and forks, butter and good tea. It differed in no respect from the table of a respectable and industrious laborer. The aspect of things here contrasted pleasantly with some other places, where I saw men who in other days had occupied the high places of the earth, and women who had once been the observed of all observers, brought into contact at the table with negroes and white persons of the lowest character, whose filthy habits and disgusting conversation, added to the bitterness of the cup which was given to these fallen ones to drink of.

There is another class, which as you well know, would not appreciate these things; they have never been accustomed to them. A long life of vagrancy has inured them to filthy habits and disgusting conduct, which makes them insufferable to the former class, and quite unworthy of privileges which ought to be freely accorded to them. If, from want of room or funds it is impossible to provide four rooms, this classification might be effected by causing them to take their meals at different times.

The best plan of placing tables is that adopted at the New York Almshouse, with some slight modifications.

Two tables should be placed across the rooms, each table long enough to hold eight persons : an alley way should extend through the room between the tables at least four feet wide. Paupers should only set on one side of the table. Each pauper should be furnished with a stool. There should be at least $2\frac{1}{2}$ feet between a table and the row of stools of the one before it.

The annexed diagram explains the construction.

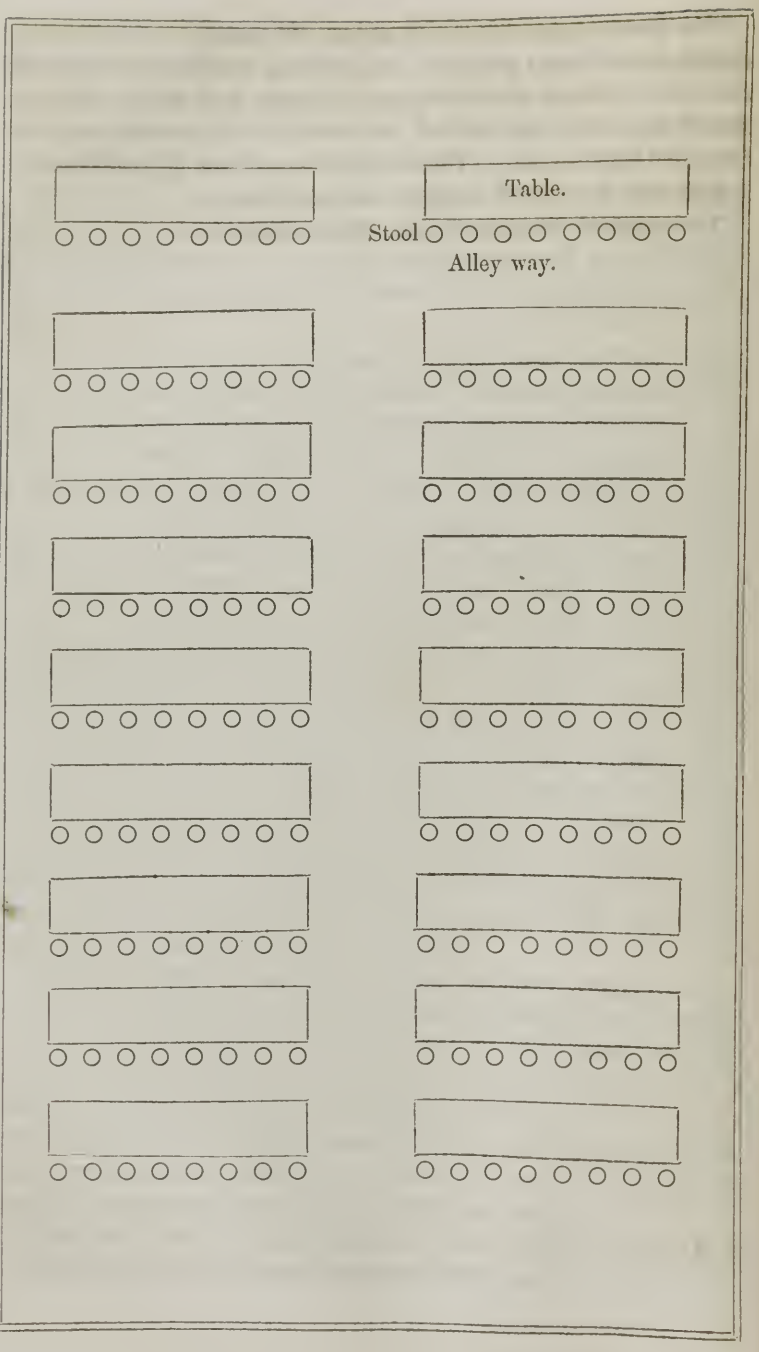


Table.
Stool
Alley way.

The table should be placed on cast iron supporters, screwed to the floor.

A few institutions use white earthenware plates, and cups and saucers, and a few use knives and forks, but in the great majority tin plates and cups are used, and no knives or forks are allowed.

Some of the officers contend, that earthen plates are cheaper in the long run, as more care is taken of them; but I am satisfied that for all except, the best class of paupers, tin ware is cheapest and knives and forks are an unnecessary expense.

There is a difference of usage with regard to the mode of feeding prisoners; some prisons feeding their men at tables, others in their cells. The greater number very properly in my opinion, feed at tables; some men do not eat their full allowance, others desire more; an exchange is easy at table, but impossible in a cell; besides eating at table is more humanizing in its tendency, and altogether preferable. I have never heard of any difficulty arising from the practice, except at the Charlestown Prison, where there was once a rebellion at table, which however was promptly quelled. The only difference between the construction of a prison dining room, and the one recommended for an almshouse, is the construction of elevated chairs along the centre aisle for the keepers on duty.

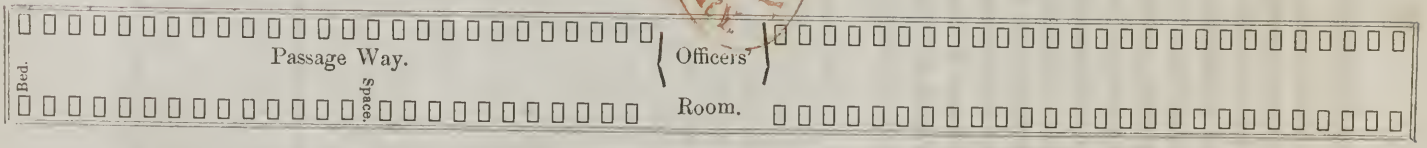
Dormitories.

The best plan for sleeping apartments that I have seen is the following:

Each pauper to sleep on a separate iron bedstead. No room to contain more than 50 beds. The beds should be arranged in two rows, on each side of the room. There should be $2\frac{1}{2}$ feet of space between each bed, and a space four feet wide between the two rows of beds. Each room should have a good water closet attached. A sufficient number of hooks should be affixed to the wall, so that every article of clothing can be hung up during the night. A lantern should be suspended from the ceiling of each room. Two of these rooms should be separated from each other by a smaller room, where an officer should sleep; doors of lattice work open from the officer's room into each of the larger dormitories; he can thus overlook one hundred beds without rising from his own. The

annexed diagram fully illustrates the plan. A stool should stand at the head of each bed, with a small drawer in it, for keeping clothing, &c. The best substance for filling the beds is rattan shavings. Captain Robbins, of the Boston House of Correction, assures me that such beds are very comfortable, and that it is impossible for bugs to live in them. The swing cots in use in the cells of prisons, prevent the proper airing of the bed clothes; it should be a universal rule in prisons for the convicts to bring out their bed and bedding, and hang them across the gallery railing opposite to their cells. At the Philadelphia Almshouse, the coverlets are nearly all white. The officers told us they were cheaper, and they preferred them because they imposed a greater necessity for cleanliness.

Dormitory, each room fifty Beds.



Heating and Ventilating.

I found schemes for heating and ventilating as numerous as the places I visited. All the contrivances were more or less effectual for the purpose of heating, but for ventilation the success was not so decided. The most thorough ventilation that I saw, was that at the Philadelphia alms house. It is unnecessary for me to describe the principle or its application, it is enough for the purpose of this report to bear testimony to the superiority of the plan adopted there, over any other that I saw. Buckenheim & Morton, of No. 16 Arch street, Philadelphia, were the contractors, and from this specimen of their skill, I should judge them to be masters of their business. 800,000 cubic feet of air are warmed by it, and the air in all the rooms is renewed every 30 minutes, at the expense of $1\frac{1}{2}$ tons of coal daily, which is a saving of 30 per cent. on their former mode of heating.

Washing.

A washing machine constructed by Silas Cornell, and in use at the Friends' School and some other public institutions at Providence, is the most complete thing that I have seen. With a mixture of 14 quarts of soft soap, 1 pint of camphene and 1 pint of spirits of turpentine, one man will wash 10 sheets in 15 minutes. The machine is on the principle of a fulling mill, and costs one hundred dollars. Were this machine substituted for the iron drum wheels at Ward's Island, I should regard the apparatus for washing and ironing as perfect as it could be, in the present state of the arts, and more perfect than any other institution in the country.

Hygiene.

If the present day presents a striking contrast to the past, in any particular, it is by the attention which is paid to the preservation of health, and to the knowledge which has been acquired of the physiological laws, on obedience to which, life and health are dependent. Hitherto, physicians have only been expected to cure us of those diseases which were penalties of the breaches of the laws of health; now, no one can lay claim to the character of a respectable physician who is not as capable of advising us how to avoid disease, as he is of curing us when prostrated by sickness.

It is not my intention in this report, to go into a detailed statement of all the laws of life and health; such a work, were I qualified to write it, could not be embraced within the limits I have prescribed for myself. I shall only, therefore, state a few of the more general and well established principles, and some of the facts which have fallen under my notice during the visits I have made under your direction.

1st. The breathing of pure air is one of the first and most indispensable conditions of health and vigor.

Breathing is the last act of digestion. Without being brought into contact with the air, the elements of food cannot be converted into blood. All the blood of the body is brought into contact with the atmosphere every half hour, and the health of the body depends upon the purity of the blood; it is obvious, then, that if the air is impure, those impurities must be communicated to the blood and disease will be engendered.

You will find in Dr. Griscom's admirable little work on the "Uses and Abuses of Air," a full account of the diseases which ensue from the inhalation of impure air; I learned an important fact at Baltimore relative to its agency in the production of Cholera. While the city of Baltimore was entirely exempt from this disease, it broke out with the utmost virulence at the alms house building, which is situated in the country, on elevated ground and apparently uniting in itself all the elements of the most perfect healthfulness. The physicians made the most careful examination of the house and grounds without discovering any thing that could possibly be suspected of causing the disease. On extending their survey *beyond* the walls, they found a large cess-pool, where the filth and ordure of the establishment was emptied; this had usually been emptied in the spring, and used on the farm as a manure; but the farmer happened to be sick at the time that this was usually done, and it was afterwards neglected. The smell of the place was exceedingly noxious, and they ordered it to be cleansed immediately; the men employed to cleanse it all died of cholera within twenty-four hours, and after it was cleansed, the cholera ceased as suddenly as it began. *No patient died of cholera whose rooms did not open towards the pool*, and no one was attacked whose rooms *did not* open towards it. These facts were stated to me first by Dr. Weime, and afterwards by the physicians of the alms house.

Air may be vitiated in various ways. 1st. By bad smells, the proximity of privies, the retention of urine in vessels in chambers, the decomposition of vegetables in cellars, and want of cleanliness generally, are the main causes of this source of impurity. They may all be easily prevented by the most obvious methods, except from the privies. Water closets may be constructed within the building so as to be perfectly free from odor, but they are too expensive and too liable to be injured to be generally brought into use in alms houses and prisons. The cheapest, the most simple, and the most useful contrivance that I have seen, is that in use at Ward's Island. It consists simply of a long trough, with a bottom sloping from one end to the other. A circular orifice, six inches in diameter, is made in the lowest end, which is filled with a corresponding plug. The trough is provided with a broad rounded board on the front edge for the thighs to rest during the defæcation. This trough is kept filled with water about 1 foot in depth, and is emptied by drawing the plug twice a day. The large body of water carries with it all fæcal impurities, and the trough is constantly kept sweet and clean. A lining of lead or zinc, will, of course, be an advantage, as wood absorbs odors while metals do not; if there is an underground drain with a *small* descent, it may require an additional supply of water to carry the ordure thoroughly away.

The scrubbing of floors with water, is sometimes a cause of disease. Odorous matters absorbed by the floor, are dissolved in the water, and when this evaporates, they are diffused through the air of the room; for this reason, dry rubbing should always be preferred to scouring in public institutions. The plan was first successfully adopted by Dr. Woodward of the Worcester Lunatic Asylum, and wherever it has been since introduced, its superiority over the old method, has been fully admitted.

When rooms are ventilated from below, upwards, the current carries with it the odors and the fine dust from the floor, which very much increases the impurity of the air; this is avoided by making the ventilation from above downward, as is the case in most modern erections. Air is also vitiated

2d. By some of the modes used for heating. Dr. Ure made some experiments on this form of vitiation* at the London custom house.

* Dictionary of Arts. Art stove.

The heating of this room was effected by the passage of air over red hot plates.

The gentlemen employed in these rooms were subject to " a sense of fullness in the head, with occasional flushings of the countenance, throbbings of the temples, and vertigo, followed, not unfrequently, with a confusion of ideas, very disagreeable to officers occupied with important, and sometimes intricate calculations. A few are affected with unpleasant perspiration on their sides. The whole of them complain of a remarkable coldness and langour in their extremities, more especially in their legs and feet."

This disorder was occasioned, 1st, By the dryness of the air, caused by the mode of heating. The air in the room indicated 70 per cent. of dryness, according to Daniel's Hygrometer, while the external atmosphere was nearly saturated with moisture.

2d. The air was probably impregnated with the sulphur, carbon, or arsenic, which exist in cast iron.

3d. By the combustion of minute particles of animal and vegetable matter with which the air is loaded, and which may, at any time, be made visible by the admission of a ray of light into a darkened room.

4th. By the high electrical tension which is communicated to air by passing over a hot plate. Dr. Ure thus accounts for the ill effects of very dry air, " When plunged in a very dry air, the insensible perspiration will be increased; and as it is a true evaporation, it will generate cold proportionably to its amount. Those parts of the body which are most insulated in the air, and furthest from the heart, such as the extremities, will feel the refrigeratory influence most powerfully. Hence, the coldness of the hands and feet, so generally felt by the inmates of the apartment, though its temperature be at or above 60°. The brain being screened by the scull from this evaporating influence, will remain relatively hot, and will get surcharged besides, with the fluids which are repelled from the extremities, by the condensation or contraction of the blood vessels, caused by cold. Hence, the affections of the head, such as tension, and its dangerous consequences. If sensible perspiration happen from debility to break forth from a system previously relaxed, and plunged into dry air, so attractive of vapor, it will be of the kind called a cold clammy sweat on the side and back. Air may be vitiated."

3d. By a privation of oxygen through breathing, and by the insensible perspiration emanating from bodies.

Six hundred cubic feet of air are breathed by an adult every hour. A cell in a prison like Blackwell's Island contains less than 300 cubic feet, there is, therefore, less than half an hour's supply of air for one person; to be pure, it should be renewed at least 20 times in the course of the night. If this is not done, the prisoner will have to breathe the pulmonary and cutaneous secretions of his own body, which must necessarily injure his health. The effect of this poisonous atmosphere is not only injurious to the body, but has a powerful effect on the mind; it irritates the brain, and induces an irascible disposition, to the existence of which a great proportion of the rebellions and outbreaks, and misconduct in our prisons and alms houses is owing.

This effect of impure air in producing an irascible disposition, is nowhere more strikingly manifest than in our legislative halls; the disgraceful altercations which so often disgrace them, will be found invariably to occur in the latter part of the sitting, when the air has become impure, in consequence of being repeatedly breathed; nor can we be surprised at this result, when we consider that oxygen is *in*haled but is not *ex*haled, being replaced by carbonic acid gas, a deadly poison, which, when pure, will extinguish life in two minutes, and that one-fifth of the blood of the body is conveyed to the brain, though its weight is only one-fortieth of the whole body. The air is also vitiated

4th. By terrene exhalations. At the last meeting of the Superintendents of Lunatic Asylums, it was agreed to embody in the form of propositions all the opinions in which that learned body *unanimously* agreed; among these is the following, which forms their ninth proposition: "No apartments should ever be provided for the confinement of patients, or as their lodging rooms, that are not entirely above ground." Common household experience shows conclusively enough, that cellars and basements are unhealthy; if a basement room is closed for a short time, the exhalations from the earth may easily be detected by the sense of smell. The only substance cognizable by chemistry is simply aqueous vapor; but there is more than this, and though so subtle as to elude the grasp of the recent chemical analysis it yet exists in sufficient force to undermine the stoutest constitution, and lay the founda-

tion for innumerable diseases of which scrofula is the genuine expression. That these exhalations interfere with the digestion, or assimilation of food seems to be proved by the experience of the Maryland Penitentiary.

All the men were allowed the same diet, both with respect to quantity and quality.

Of 11 blacksmiths employed in making railroad spikes, all gained in weight. The average gain of each person, was 6.25 lbs.

Of 5 prisoners employed in the dormitories, in sweeping and whitewashing, all gained. The average gain of each person being 5.2 lbs.

Of 9 shoemakers all gained. The average gain being 6.5 lbs.

Of 29 weavers, 21 lost weight. Average loss, 5 lbs. Eight gained weight. Average gain, 5.3 lbs.

Of 9 broom-makers, 6 lost weight. Average weight lost, 13.5 lbs. Three gained. Average gain, 2.3 lbs. One of the men employed in the broom-shop, aged 33, lost 39.5 lbs.

The difference between this shop and the others, will be seen at a glance; all gained in weight except the broom-makers and weavers, and between these, the former suffered most severely. I was informed by Dr. Frick, that the men in the broom-shop were constantly troubled with catarrhs and rheumatisms, and that when their flesh was in any way wounded, it healed with great difficulty. On carefully comparing this shop with the others, I found it to differ from the rest in two respects. 1st. It had a brick floor, resting directly on the earth; and 2nd, the odor of paint was constantly diffused through its air.

Both of these circumstances probably contributed to produce the result, but taken in connexion with observations, made at other places, I have no doubt that the exhalations from the earth was the main cause of the difficulty.

II. Cleanliness of the person is of the utmost importance for the preservation of health.

When we consider that there are, on an average, 2,800 pores on every square inch of the human body, and that the ordinary number of square inches on the surface of a man, is 2,500, we find that the whole number of pores is 7,000,000; we cannot doubt these

orifices are invested with some most important function. Our convictions are strengthened, when we consider further, that each of these pores is the outlet of a perspiratory tube a quarter of an inch in length; hence, the total length of this system of drainage, is TWENY-EIGHT MILES in every full grown man. At the bottom of each of these tubes is a sponge-like body, which sucks up the impurities of the blood contained in the capillaries around, and ejects the excrementitious matters through the pores, in the form of insensible perspiration. It is evident that the Creator, who makes nothing in vain, intended that this immense and complicated system of drainage should perform a very important part in the animal economy. In fact, by its agency, there are nearly three pounds of matter which would be poisonous, if retained in the system, ejected every twenty-four hours. If a rabbit is covered with an impermeable coating of varnish, so as to close the pores completely, his blood becomes a poison, owing to the presence of these excrementitious matters, and he dies of asphyxia in about an hour and a half. Anything which obstructs the free action of the perspiratory apparatus even in a slight degree, is therefore injurious to health. To maintain this action of the skin in its integrity, thorough bathing is necessary, at least three times a week in summer, once a week in the spring and autumn, and once a month in the winter season. This is especially necessary for the restrained and artificial mode of life that prisoners are compelled to submit to, and ought always to be enforced, unless contra indicated by disease.

Every prison and alms house is incomplete, if unprovided with a swimming-bath, 25 feet square and 6 feet deep, or bathing tubs of the ordinary kind, and a shower bath of at least 4 feet fall.

It is well known, that public institutions, especially those designed for children, are very liable to the prevalence of sore eyes, and when one person is attacked, it is very likely to spread to a great number; the purulent matter which exudes from the eyes, adheres to the basin in which they are washed, and if the next washed brings the slightest particle of it into contact with his own eye, he is sure to contract opthalmia. This spreading of the disease is prevented by a very simple contrivance in use at Randall's and Ward's Islands, and invented, I believe, by Dr. Whittlesey. It consists of a tube about seven feet in diameter and

two feet deep, around the upper circumference of this tub, a lead pipe one inch in diamater is placed, which is provided with small orifices about one foot apart. When water is admitted into the pipe, a jet is thrown up from each orifice, with a force, and to an elevation proportioned to the head of water on the pipe. Each child can bathe his face over these jets, without rubbing his eyes, and it is obviously impossible that purulent matter can be carried in this way to a well eye.

III. Exposure of the surface to the direct rays of the sun, is another of the conditions on which health is preserved. We are unable to explain the rationale of the sun's action, but we know that the rays of the sun are capable of inducing intense chemical action, and it is probable their presence is able to determine some of the wonderful processes of vital chemistry on the action of which the integrity of the system depends.

Although we cannot precisely explain the action of the sun's rays on the body, the fact of the necessity of their presence is beyond controversy ; the blanched and etiolated appearance of those who are secluded from them, is obvious to the most superficial observer, and the evil influence on the health of such privation, is well known to every physician who has ever been connected with a prison.

The health of the pupils of the school for the blind, under the care of Dr. S. G. Howe, has been most remarkable, and much of their exemption from disease is attributed by the officers to the enforcement of the rule that no pupil shall remain within doors more than three quarters of an hour at one time, or, in other words, each pupil is compelled to spend fifteen minutes out of every hour, in the open air. It is very desirable that every prisoner should exercise in the open air, at least one hour out of the twenty-four.

IV. Care should be taken, that the food is sound and wholesome.

In prisons and alms houses supplied by contractors, food is sometimes furnished of a very deleterious quality, and frightful diseases and loss of life has been the result. In one case, at Auburn prison, a severe disease was engendered by a lot of un-

sound fish that was furnished by the contractor; but this thing has been of too frequent occurrence, and the danger is too well known to the officers of prisons and alms houses, to make it necessary to enlarge upon it in this report.

Labor.

It is of the utmost importance to provide labor for the prisoners and paupers. It is important to provide it when it can be profitable to relieve the honest and industrious classes from the expense of supporting the idle and dissolute. It is also important to provide it for the welfare of the prisoners and paupers themselves, even if no pecuniary gain resulted from the provision. Very much of the crime and pauperism extant results from the want of early training, and instruction in the regular pursuits of industry. When children are taught in early youth, the value of time, the importance of economy, and the habit of persevering industry, it is very rare that they lapse into crime; when the early neglect has ripened into its legitimate fruit, it is surely the duty of the State and its ministers to strive to eradicate the germ of their misfortunes by repairing the errors of their early education.

The poor law commissioners of Great Britain year after year bear testimony to the necessity of providing a test of work for all who seek the bounty of the public, and their views are amply borne out by the unerring dictates of experience. The following is an extract from the sixth annual report: "Sir John Walsingham was, on the 4th of April, in the present year, informed that a petition from the weavers of Carlisle had been brought up, most properly worded, and respectfully presented to the Board of Guardians of the Carlisle Union by a body of working men, on Thursday the 2d of April; that the Guardians having admitted and conferred with a deputation from this body, had directed the relieving officers to take down the applications of all who affirmed themselves to be in need of relief, in order that they (the guardians) might be in a position to deal with them on the following day (Friday) to which the meeting was then adjourned; and that on Friday, the guardians being still unprepared to settle definitely the future plan of proceeding, had been under the necessity of giving relief in aid of wages for one week to 3 or 4 hundred weavers, (being heads of families,) after the average rate probably of 1s. 6d. to each, in money or money's worth.

On Wednesday, the 8th of April, a meeting of the Chairman, Vice-Chairman and Principal Guardians of the Union, was held, at which Sir John Walsingham was present; and in conformity with his suggestions, it was agreed that a resolution should be proposed and promulgated on the following day (Thursday 9th April) to the effect, that from and after Thursday the 16th of April, the Guardians should give no relief whatever, unless the person relieved was wholly out of employment, and would regularly work in breaking stones, or in such other labor as the Union authorities might provide.

It was also agreed that for the first week (i. e. from the 16th to the 23d of April,) the weavers who should go to work on account of the parish might be paid by the day until they should become accustomed to the use of the hammer, but that for the second and subsequent weeks (i. e., from the 23d of April,) they should be paid by the piece, receiving the wages of independent laborers on the highways, viz., 10s. 6d. per yard for stone breaking." The result of these measures is thus stated by Sir J. Walsingham.

"The guardians sat for 12 consecutive hours, notwithstanding that they had divided themselves, for the more speedy transaction of business, into three sections; and they had to relieve on this day (9th April,) between 400 and 500 heads of families. In relieving them, however, each applicant was made duly aware of the board's resolutions, and that no more relief in aid of wages would be allowed; and they were also informed that, if they could not maintain themselves and families by the loom, the guardians would pay to them wages for stone breaking, &c., at which they might, if they chose to exert themselves, obtain a subsistance; but that at all events, they would no longer be permitted to be partly paupers and partly independent workmen.

The applicants relieved in aid of wages on Thursday, the 2d of April, (the first day of the crisis,) numbered between 300 and 400, and between 400 and 500 on Thursday, the 9th of April, the second week of the crisis.

On Thursday the 16th of April, (the third week of the crisis,) when it was tolerably notorious that *work*, and not alms, would be given, there presented themselves but 50 applicants, to try how far the guardians were in earnest. The stone yard, and in some few cases the workhouse, was offered to these fifty individuals; and I

found on examination of the labor book, that out of the 50, six only had availed themselves of this relief.

On Thursday, the 23d of April, (from which day piece-work was to begin,) I attended the Board of Guardians, and I don't think 10 applications from weavers came before us, and of the 10, four were from the six stone breakers of the preceding week; three of whom, as being known of old for idle, ill-conducted men, received orders of admittance into the workhouse; whilst the fourth, as being infirm of body and industrious in disposition, received a month's out relief.

The Guardians of the Carlisle Union thus terminated a crisis, of which the first appearance was sufficiently formidable, by demonstrating, in the most rapid and decisive manner, not only the effectiveness of the principle on which the workhouse system is based, but the overwhelming mischiefs and difficulties into which any attempts to make up wages out of the poor rates, must even plunge the administrators of relief.

I have thus at the hazard of wearying you by prolixity, spread out the full report of the Assistant Commissioner, which demonstrates the necessity for providing a test of labor for all those who seek a maintenance at the public expense. Were it necessary, this testimony might be corroborated from almost every one of the Reports of the Poor Law Commissioners of England, but that you will scarcely deem it necessary; your own experience will have amply proved to you, that very many throw themselves on the public for support who would never think of doing so, were they compelled to labor in return for their support.

There are men who make it a regular business to travel from one poor house to another, and it is not unfrequent to hear knots of these gentry grouped together, conversing on the merits and demerits of the different alms houses of the country, just as fashionable travellers discuss the comparative merits of our first rate hotels.

Justice to tax payers and to the paupers, seems to require that labor of some sort should be provided at every institution designed for their reception. Nothing can be conceived more demoralizing in its tendency than the habit of dependence which public support without labor in return, entails upon those who give themselves up to it; they themselves are useless to the community, while their

children almost invariably become its scourge, and end their days either in a prison or on the scaffold.

Although the necessity for the provision of labor is apparent, the kinds of labor to be introduced, and the mode of conducting the work is unfortunately a very difficult problem.

By an inspection of the table marked I, you will perceive that the average amount of labor obtained from the paupers of all these institutions, which embrace, among others, all the poor houses in New York and Massachusetts, is only $3 91 per capita per annum. While table J, although showing an increased amount of earnings, is yet far from being a flattering exhibition of the power of making the earnings of convicts adequate to their support. The earnings of the Massachusetts State Prison have been sufficient to support it without the aid from the State Treasury since 1831. And the same has been done at Auburn for many years, but with these exceptions, and that of Weatherfield, I do not know of a single institution for either paupers or criminals, which for any considerable time has been self supporting.

The expenses of Maine State Prison over and above the earnings of the convicts for 1850, was $5,000. Number of convicts 67.

Excess of expenses above earnings in New Hampshire State Prison for 1850, $6,634. Number of prisoners 82.

Excess of expenses over earnings in Vermont State Prison, $4,261. Number of prisoners 62.

Excess of expenses above earnings in Rhode Island State Prison for 1850, $5,087. Number of prisoners 84.

Excess of expenditures above earnings Sing Sing Prison, $28,181. Number of prisoners 672.

Excess of expenses above earnings, Female Prison, Sing Sing, $8,038. Number of prisoners 78.

Excess of expenses over earnings at the Eastern Penitentiary, Pennsylvania, was $4,864, *not* including salaries of officers. Number of prisoners 299.

Excess of expenses over earnings at Baltimore Penitentiary, not including salaries of officers, $16,123. Number of prisoners 229.

Excess of expense over earnings in Michigan State Prison, $12,687. Number of prisoners 110.

There are many reasons why the labor of paupers and criminals should be unproductive. The cause of their becoming such, in a great majority of instances, is a certain imbecility or obliquity of mind, which renders them incapable of obtaining a livelihood in a regular way. Even where there is the physical ability to labor, there is a deficiency of judgment which prevents them from selling their labor in the most profitable market, or from taking care of their earnings after they have received them. It is very rare to find either a criminal or a pauper who is qualified to make a living by honest industry; in nine cases out of ten, some bodily or mental infirmity is the cause of their falling into pauperism or crime, and this infirmity which renders them unable to support themselves in the world, makes them unprofitable laborers in the alms house or prison.

This peculiar heedlessness of the pauper or prisoner, causes them to spoil so much of the materials and tools entrusted to their charge, that their labour would be unprofitable from this cause, if from no other. The asylum at Blockley, near Philadelphia, is fitted up with a steam engine, and much expensive machinery, but it is rarely used, as the waste and destruction of machinery is greater than the profits of the paupers' labor.

Another thing which very much diminishes the value of pauper labor, is the absence of that hope of reward, which all experience teaches is the most powerful stimulus to industry. If the criminal or the pauper drags through the day with just sufficient motion to preserve him from punishment, his object is attained; he will not make any willing effort to increase his production, to make the most of his materials, or to improve his workmanship.

The most serious obstacle, however, to the profitable employments of prison and pauper labor, is the difficulty of procuring competent managers. The ability to organize labor, to discover the capacities of men, to elicit their utmost powers, and to direct those powers into the most profitable channels, is a gift possessed by very few; and those who are competent to conduct the large and complicated business relations of a large prison, with complete success, can secure far greater pecuniary rewards in business, than they could receive as a salary from any institution in the country. Still, since prisons and almshouses have in some cases been made self-supporting, we are not to despair of doing so in others with equal good management.

As the result of my most careful inquiries, I am of opinion that no species of labor is so well adapted to paupers as agricultural and horticultural labor. So far as I was able to learn, four-fifths of the paupers in the northern states have never learned any trade; their stay in the almshouse being voluntary, they do not stay long enough to acquire a trade thoroughly; and as I have before remarked, they labor under the disadvantage of a certain mental imbecility, which disenables them from learning any trade to advantage. This difficulty does not exist in agriculture or horticulture; any one can pull weeds, spread manure, or perform any horticultural process under the direction of a skilful gardener. Those institutions which are best provided with the means of employing paupers in the cultivation of land show a better pecuniary return for labor than any others, as South Boston, Providence and Newport, while those that have expended capital largely in providing machinery, have in most instances failed in making it remunerative. I therefore strongly recommend, that the main reliance of pauper establishments for profitable labor of their inmates, should be on the cultivation of land. I shall only suggest such other branches of labor as may be easily learned, and which require better taste and genius for their acquisition. For children, knitting socks, and mittens for the younger, and the making of children's shoes for the elder children, are employments well adapted to their capacities, and are as profitable as any that I have found. The boys at the Reform School, Boston, learn to make these shoes readily in a fortnight, and will turn off ten pairs of shoes in a day. The making of razor strops is well adapted for children; at first view this seems a trifling business, but the number made annually is enormous.

One manufacturer offered to employ all the boys in the Philadelphia House of Refuge at this business, and allow a shilling a day of six each hours' work of each boy. Book-binding, is also well adapted for childrens' labor; they learn in a week to bind school books, and in the vicinity of large publishing houses, this is a kind of work which can easily be obtained at fair prices for the labor.

Seating cane chairs, making umbrella stretchers, covering trunks, and other similar occupations, are well adapted to this class of children.

For adult paupers, mat-making, from the husks of Indian corn, straw-hat making, shoe-making, spinning, knitting, stone-breaking, for McAdamized roads, and pounding bones for manure, are valuable as auxiliaries for the employment of paupers. Some paupers discover an astonishing aptitude for cutting and carving, these might be profitably employed in making from bone, islet prickers, tooth picks, and similar articles, while others might cut children's toys out of wood, make pill boxes, match boxes, horse and fish nets, and other occupations of like character.

Practical Recommendations.

I recommend for Ward's Island Refuge, the following bill of fare:

Breakfast.—Half pound Graham bread, one herring and rye coffee.

Supper.—Four times a week, mush and molasses, (five ounces of Indian meal and half gill of molasses;) three times a week, rice and molasses, (four ounces of rice and half gill of molasses.)

Dinner.—*Sunday*, rice hash, (three ounces of meat and four ounces of rice to each person.) See bill of fare, Mass. State Prison. Twelve ounces corn bread. See bill of fare, Washington Asylum.

Monday, baked pork and beans, five ounces pork, and five ounces beans to each person.

Tuesday, six ounces corned beef, eight ounces potatoes, twelve ounces corn bread.

Wednesday, six ounces fresh beef, made into soup, twelve ounces corn bread, and eight ounces beets, carrots, or turnips.

Thursday, same as Wednesday.

Friday, four ounces salt fish, twelve ounces potatoes, and twelve ounces corn bread.

Saturday, same as Wednesday.

As fast as it can be done with a due regard to economy, I recommend, on the score of health and economy of fuel, the introduc-

tion of the plan of heating and ventilating in use at the Blockley Alms House, Philadelphia.

I advise that the shingle roofs at Ward's Island be painted with the Ohio Stone Paint; roofs painted thus are incombustible, very much more durable, and less likely to leak ; most of the roofs at Ward's Island, are very liable to take fire from the chimneys, and the security which the Ohio Paint confers against fire is sufficient to repay its cost, independently of the other advantages derived from its use.

I advise that a law be procured from the Legislature requiring the County Clerks in this State, to keep registers in which the names of persons desiring to employ servants should be registered together, with the kind of work required to be performed, and the wages they are willing to give ; a copy of such register to be transmitted weekly to the Commissioners of Emigration. It appears to me, that this would be a cheap and efficient means of relieving the Commissioners of their burden, and confer a great favor on the people of this State who require the services of male and female servants.

An immense saving may be made at Ward's Island, by the thorough cultivation of the land. For this purpose, I recommend that the washings of the privies be collected in cess pools to be used as manure, a great proportion of it can used in the recent semi-fluid state, and all odours can be absorbed by the daily sprinkling of gypsum and powdered charcoal. Immense quantities of asparagas and rhubarb, by the use of this liquid manure, could be raised on the Island for sale. Strawberries, raspberries, grapes and melons, would be also easily produced and command remunerative prices.

I would also advise, that a part of the people at the Refuge should be employed in making corn husk mats, and braiding straw hats. Husks and straw can be procured in the auntum in any quantities.

Any one can learn to make mats in an hour, and straw hats in a very little time. Among so many emigrants, some must be tailors, and shoe-makers, these of course would be employed at their own trade, and in general it would be well to provide conveniences for the exercise of those trades, which experience shows are most frequently professed by emigrants. But whatever kinds of employment are selected, I would maintain it as a cardinal principle,

that every able bodied person, whether child or adult, should be kept in regular and active employment.

I recommend the enactment of a code of regulations for each institution, to be printed and placed in the hands of each person employed, in which the duties and responsibilities of each officer should be distinctly laid down, and specific directions given for their conduct in various emergencies; this is particularly necessary in case of fire, the officers ought to known before hand what is to be done, and the precise order in which they should be done, let the fire break out when and where it will. I beg to refer you to the fourteenth annual report of the Poor Law Commissioners of England. To the code of rules for Massachusetts State Prison, where the duties of officers in relation to the breaking out of a fire, are laid down with singular clearness and good sense. To the rules of the Baltimore and Philadelphia Alms-Houses, and those for the government of the House of Correction at Boston. On the basis of these codes, modified by your own experience, and the peculiarities of the Institutions committed to your charge, you will be able to construct a system of regulation that will very materially alleviate the burden of your own duties, make the duties of your officers easier and more grateful, and remove many of those causes of irritation and disquietude on the part of the inmates which invariably spring up when the rule of their conduct is merely the will of the officer in charge.

The system of accounts, and the contrivances for checking fraud and speculation, adopted by the Commissioners, are greatly superior to most of the institutions in the country. They are superior to all others in this. The number and character of the articles in each room can be at once ascertained from the books of the Refuge; thus, if it was desired to know how many tin cups there were in the dining room, the number would be ascertained in a moment at the office, and the correspondence can at once be ascertained by counting, and the person in charge of the room held responsible for any deficiency.

The aggregate value of the minor articles in a large institution is not small, and on that account is worthy of attention, but the moral effect of a rigid system of accountability is even more desirable than the pecuniary saving which is effected by it. As I have seen nothing better in the accounts of other institutions, I have no alteration or improvement to recommend.

I also advise, that a book should be kept at each institution, in which the following facts should be registered in parallel columns. 1st, name of pauper or prisoner; 2nd, age; 3rd, height; 4th, weight on admission; 5th, occupation before entrance; 6th, occupation after entrance; 7th, capacity of the chest. This may be measured with great accuracy by means of a very simple and inexpensive apparatus. It consists of a tall glass jar, of small diameter, graduated to one-sixteenth of an inch on the sides. This jar is to be filled with water, and inverted over a pneumatic cistern. The pauper is then directed to fill his chest with air, and to expire it into the graduated jar through a bent tube; the space occupied by the air in the jar will then be an exact measure of the capacity of the chest. 8th, weight on the first day of every succeeding month.

Four or five classes of ten each, should be selected for experiment on the effect of various diets and modes of cookery. I recommend that the object of the first set of experiments should be, to ascertain how far the tables of dietetic equivalents founded on the relative amounts of nitrogen and carbon in each article of food, as determined by chemical analysis, can be relied on as a guide in practice.

For the Alms House at Blackwell's Island, I recommend for non-working paupers, the same bill of fare as already laid down for Ward's Island. For working men, an addition of 33 per cent. on all articles except bread for dinner.

For the Penitentiary at Blackwell's Island, I advise the same bill of fare for the female prisoners as already advised for the Alms House.

For Male Prisoners.

Breakfast.—Same as now used, except that the bread should be Graham bread, and one herring to each prisoner.

Supper.—Same as now; Graham bread.

Dinner.—*Sunday*, baked pork and beans, 8 oz. pork, 1 gill beans, 12 oz. corn bread.

Monday, 12 oz. fresh beef made into soup, 12 oz. corn bread, 8 oz. beets, carrots, turnips or parsnips.

Tuesday, rice-hash, 6 oz. meat, 6 oz. rice; 12 oz. corn bread, 4 oz. potatoes; the meat to be 3 oz. pork, and 3 oz. beef.

Wednesday, baked pork and beans, same as Sunday.

Thursday, same as Monday.

Friday, 6 oz. cod fish, 12 oz. potatoes hashed, 12 oz. corn bread.

Saturday, 12 oz. corned beef, 10 oz. potatoes, 8 oz. beet, or some other vegetable.

Randall's Island bill of fare, I advise should be constituted as follows:

Breakfast.—*Sunday* and *Wednesday*, mush, (4 oz. Indian meal,) and half a gill of molasses.

Monday and *Thursday*, 6 oz. Graham bread, 2 oz. cheese, 1 pint cocoa, (three quarter oz. cocoa, half oz. sugar, 1 gill milk.)

Tuesday and *Friday*, 1 pint milk porridge, 6 oz. Graham bread.

Saturday, boiled rice, (4 oz.) with milk or molasses.

Dinner.—*Monday* and *Wednesday*, 5 oz. roast meat, 6 oz. corn bread, 5 oz. potatoes.

Monday and *Thursday*, 5 oz. meat made into soup, with 6 oz. beets, carrots or turnips, 6 oz. corn bread.

Tuesday, 4 oz. fresh fish boiled, 6 oz. corn bread.

Friday, 4 oz. salt fish, 6 ounces potatoes hashed.

Saturday, 5 oz. corned beef, 4 oz. rice pudding.

Supper.—*Sunday* and *Wednesday*, 6 oz. Graham bread, three quarter oz. butter.

Monday and *Thursday*, 6 oz. Graham bread, half pint milk.

Tuesday and *Friday*, 6 oz. Graham bread, one and a half oz. cheese.

Saturday, boiled rice, with molasses.

Conclusion.

I cannot bring this report to a close, without bearing a willing and honest testimony to the excellence of the management exhibited in the institutions committed to your care. This is shown in the economy, cleanliness, comfort and good order which are visible on every hand.

When you requested me to undertake a mission to the public institutions in our large cities, you expressed so strong a sense of the deficiencies of your establishments, and so strong a desire that prompt and efficacious remedies should be ascertained and applied, that I fully expected to be able to furnish you with most extensive plans of improvement. Now, when my mission is accomplished, I return with the most meagre list of improvements, because I have really found very little that is superior to yours, and very few that are at all equal.

When I look at the herculean task undertaken by the Commissioners of Emigration, the difficulties they have encountered, with inadequate funds, buildings and appliances, I cannot withhold a tribute of grateful praise to the energy, the skill and the self-denying labor, which in so short a time has brought order out of confusion, and established a comfortable home and an ample provision for the wants of the shoals of destitute and unfortunate emigrants, which the circumstances of European nations are continually forcing upon our shores.

The noble bakery at Blackwell's Island is well worthy the study of those interested in the administration of charitable institutions, and the bake-house recently erected by the Commissioners of Emigration at Ward's Island, of ample size and replete with every convenience and every contrivance for economy, will soon exercise a marked and decided influence in reducing the expenditure for provisions.

I should be untrue to my feelings, were I to omit an acknowledgment of the unvarying kindness and attention that I received from the officers and managers of every institution that I have visited. All the details of management have been thrown open to my inspection, without the slightest hesitation or reserve, and copies have been kindly made of such documents as I desired to carry home.

My thanks are especially due to Dr. Given, of the Eastern Penitentiary, and to Dr. Isaac Parish, of Philadelphia; to Dr. Frick, of the Maryland Penitentiary, and to Dr. Waine, of Baltimore, for most valuable information, and for much kind personal attention.

I trust that my mission, however meagre its present results may be, will be found useful, by turning the attention of the managers of public institutions to the importance of collecting safe and reliable data from which we may eventually be enabled to determine, with reasonable certainty, the cheapest and the best mode of employing the able-bodied, and supporting the sick and infirm pauper.

Pauperism is *increasing* amongst us in a *fearfully* increasing ratio. I am unable to state the rate of increase for the whole country, but from the inquiries I have made, I am satisfied it is increasing quite as fast as in the State of New York.

In the State of New York, the total number of persons relieved and supported, was 15,564, and the whole cost of their relief and support, was $245,433 21, in A. D. 1832.

In the year 1850, the whole number relieved and supported, was 99,433, at an expense to the tax payers of $816,858 90, being an increase of tax for the support of pauperism, in 18 years, of 233 per cent. from 1832 to 1850. In 1832, 1 person was relieved at the public expense, to every 156 inhabitants; it was 1 to every 31 inhabitants in 1850.

In 1832, the cost of relieving and supporting the poor, was thirteen cents and one mill to every man, woman and child in the State.

In 1850, it was twenty-six cents and four mills. From these statements, it appears that the tax for the relief and support of the poor, has rather more than doubled in eighteen years.

We cannot flatter ourselves that the increase of pauperism, and the consequent increase of taxation, will not continue; the example of other nations, forbids us to lay this "flattering unction to our souls." In England, in 1850, one person was relieved or supported to every twenty inhabitants, while the cost of their support was equivalent to the payment of $1 50 by every man, woman and child in the country. In Ireland, every fifth man is a pauper, with little prospect of improvement.

Facts like these, are eloquent; they commend themselves alike

to the patriot, the Christian, the philanthropist, the statesman and the tax-payer, and call loudly upon every one interested in the administration of the poor-laws, to collect all the facts and experiments which will enable us to mitigate the pressure of this great evil, with all the economy compatible with humanity.

That much might be done by skill and good management, to diminish the taxation arising from pauperism, is demonstrated by the following statement. I have no reason to believe, that the poor in the counties of Cataraugus and Lewis, are in any degree better treated than they are in the counties of Putnam and Orange; yet the average weekly cost of the support of the poor in Putnam county, was, for six years, thirty-five cents, and the cost in Orange county was thirty-nine cents, while in the County House of Cataraugus it was seventy-two cents, and in Lewis county it was seventy cents.

I might multiply similar examples of the disparity of cost in the maintenance of paupers in the different counties of the State to any extent; but the above are sufficient for my purpose; it will be noticed, that the counties of Orange and Putnam are in the vicinity of New York, where the cost of living is much greater than in the remote counties of Cataraugus and Lewis, and the difference can therefore only be attributed to superior management.

With thanks for the kindness with which you have promoted the objects of my mission, I respectfully submit my report for your consideration.

JOHN STANTON GOULD.

BILLS OF FARE AT VARIOUS INSTITUTIONS.

1. Ward's Island Bill of Fare—Refuge Department.

Sunday.—The *breakfast* consists of 8 oz. bread, half oz. coffee to each person. On Thursday the breakfast consists of mush and molasses.

The supper invariably consists of bread and tea, 8 oz. of the former and one-eighth oz. of the latter.

The dinners are as follows:

Sunday.—1¼ lbs. boiled rice and molasses, 8 oz. bread.

Monday.—8 oz. corned beef or pork, 8 oz. bread.

Tuesday.—8 oz. fresh beef, with soup made from it, and 8 oz. bread.

Wednesday.—8 oz. beef or pork, and 8 oz. bread.

Thursday.—8 oz. fresh beef and soup, 8 oz. bread.

Friday.—8 oz. salt fish, with potatoes, and 8 oz. bread.

Saturday.—8 oz. fresh beef and soup, 8 oz. bread.

The soup is made by boiling, for 3 hours, in 200 galls. of water 650 lbs. of beef, 40 lbs. rice, 1½ lbs. of pepper, together with leeks and carrots. The soup meat consists of shins, neck pieces, shoulder clods, and sockets. The crumbs of bread left on the tables are collected and put into the soup. Boiled by steam, but it is not admitted into the boiler. By weekly returns, ending March 22d, it appears that 9 oz. of potatoes are consumed by each person per week; 2 oz. beans per week; ½ gill. molasses; 1¼ oz. rice. It will be seen that the weekly requisitions do not correspond with the above, which gives 1¼ lbs. per week. I cannot account for this discrepancy. 1 quart of milk is allowed to each nursing woman per day.

Bill of fare—Randall's Island.

Breakfast.—Every day in the week is milk and water, and molasses and bread.

Supper.—Every day, except Sundays and Fridays, consists of rice and molasses, or mush and molasses, sometimes milk is substituted for molasses. On Saturdays and Fridays, milk and water, and molasses and bread are given.

Dinner.—Monday, salt beef and potatoes.

Tuesday, fresh beef made into soup.

Wednesday, pork and potatoes and parsnips.

Thursday, roast beef and gravy.

Friday, salt fish and potatoes.

Saturday, fresh meat and soup.

Sunday, mush and mik.

Soup is made by boiling 710 lbs. meat in 160 galls. water; to this is added 4 bushels turnips, 1 bush. parsnips, one-half bush. onions, one-half bush. carrots. The soup is boiled by steam, which is *not* admitted into the boiler.

There is no regular allowance of food *by weight* to the inmates; but a calculation founded on an examination of the return made for the week ending March 31st, it appears that the average consumption of bread per day, for each inmate, was 1 lb.; of meat, $6\frac{2}{3}$ oz., for 6 days; of salt fish, 4 oz., for 1 day; of molasses, $2\frac{1}{2}$ gills per week; of Indian meal, 3 oz. per week; of rice, 6 oz. per week. I cannot ascertain the quantity of potatoes consumed here.

BILL OF FARE—NEW YORK ALMS HOUSE.

Dinner Table, for Working Men.

Days.	lbs. of Fresh Beef.	lbs. of Pork.	lbs. of Bread.	Bean Soup.	Beef Soup, with vegetables.	lbs. of Codfish.	Potatoes.
Monday.....	½ pound.	½ pound.	½ pound.	3 ½ pints,			
Tuesday.....	"		"	including	3 ½ pints.		
Wednesday....	"		"	about one	"		
Thursday.....	"		"	gill of	"		
Friday.....			"	beans and		⅛ pound.	1 lb.
Saturday.....	"		"	peas each	"		
Sunday.....	"		"	ration.	"		

SUPPER,

½ lb. of bread, ⅛ of an ounce of tea.

BREAKFAST,

½ lb. of bread, ⅜ of an ounce of coffee.

Dinner Table, for Males and Females unable to work.

Days.	lbs. of Fresh Beef.	lbs. of Pork	lbs. of Bread.	Indian Meal made in Mush.	Molasses.	Beef Soup, with Rice and Vegetables.	lbs. of Codfish.	Potatoes.	Boiled Rice.
Monday....	½ poun	½ lb.	½ lb.						
Tuesday....				4 ounces.	½ gill.				
Wednesday	1 pound		½ lb.			3 ½ pints.			
Thursday...				4 ounces.	½ gill.				
Friday....			½ lb.				¾ lb.	1 lb.	
Saturday..	1 pound.		½ lb.			3 ½ pints.			
Sunday....					½ gill.				5 oz.

Soup made as follows: 600 lbs. meat, 18 lbs. rice, 50 heads of cabbage, and 1 quart salt, boiled in 186 galls. water; boiled by steam; steam not admitted into the boiler.

4.—Bill of Fare of Penitentiary, Blackwell's Island.

Breakfast.—¾ lb. bread, ½ oz. coffee.

Supper.—Mush and molasses, and rice and molasses alternately

Dinner.—*Sunday*, ½ lb. pork, 1 lb. beef, ¾ gill beans.

Monday, 1 lb. fresh beef made into soup, ¾ lb. bread.

Tuesday, same as Monday.

Wednesday, same.

Thursday, 1 lb. pork, ¾ gill beans, and 3 potatoes.

Friday, same as Monday.

Saturday, same as Monday.

For the supper of mush, 2½ oz. Indian meal are allowed to each.

For the supper of rice, 2¼ oz. are allowed to each.

½ gill of molasses is allowed to each prisoner for supper.

The daily consumption of bread per man, is 1¼ lbs.

The soup contains, in addition to the meat for the day, turnips, carrots, and is usually thickened with Indian meal.

It is boiled by steam, which is admitted directly into the boiler.

The coffee is made by mixing 40 lbs. coffee with 2 bushels of peas, and roasting them together.

5.—Bill of Fare at the Philadelphia Almshouse.

Breakfast.—Bread and coffee.

Supper.—Bread and tea.

Dinner.—*Sunday*, beef and mutton soup.

Monday, cold corned beef and bread.

Tuesday, mush and molasses.

Wednesday, beef and mutton soup.

Thursday, cold corned beef and bread.

Friday, Cod-fish and potatoes.

Saturday, roast beef or mutton.

The old women are allowed butter with their bread.

There is no regular allowance with respect to the quantity of food allowed, each one being permitted to eat until he is satisfied.

On examining the accounts of the institution, and comparing the number of pounds purchased, with the weekly average number of inmates, it appears that 8 oz. of meat per day, were allowed for 5 days in the week; 3 oz. fish, and 1 lb. potatoes, 2 days in the week; 8½ lbs. bread for each person per day.

Soup is made from 300 lbs. meat, I bush. 2 pecks and 2 quarts of beans; 2 pecks of onions, and the bread left at table the preceding day, being boiled in 100 gallons of water for 4 hours.

The tea is made at the rate of 11 oz. to the 100 persons.

Coffee at the rate of 40 oz. to the 100 persons.

6.—Bill of Fare, Moyamensing Prison.

Breakfast.—1¼ lbs. of bread are given to each prisoner in the morning which is to last him the whole day. Coffee once a week. The convicts have mutton made into soup. Two days in the week they have corned beef, and four days fresh beef. Prisoners sentenced by the court, are allowed wheat bread. Vagrants have rye bread.

7.—Eastern Penitentiary, Philadelphia, Bill of Fare.

Breakfast.—1¼ lbs. bread are given to each prisoner, which lasts him the whole day. 5 mornings in the week, the prisoners have tea at the rate of ¼ oz. per man. 2 mornings in the week, they are furnished with coffee, at the rate of ⅓ of an oz. per man; the coffee is pure, and the tea is a good quality of hyson.

Supper.—Tea, the same as for breakfast.

Dinner.—*Sunday*, ¾ lb. meat, free from bone, hashed with onions.

Monday, smoked bacon and shoulders, 12 oz. per man.

Tuesday, mutton soup, 13 oz. meat.

Wednesday, same as Sunday.

Thursday, ¾ lb. pork with bean soup in winter, and soup the same as Tuesday in summer.

Friday, same as Sunday.

Saturday, same as Tuesday.

8 lbs. of sugar is allowed to 310 prisoners for sweetening their tea in the morning, and the same quantity in the evening. 2½ gallons of molasses are used to sweeten the coffee for the same number, being 0.41 ounces of sugar to the tea of each prisoner, and 0.26 gills of molasses to the coffee of each prisoner.

Half a gallon of molasses, and as much salt and vinegar is allowed to each prisoner monthly, as he desires. It is kept in the cell, and used at discretion. In the winter season, bean soup is allowed with pork. And hominy and molasses is sometimes given for breakfast by way of change.

Bill of Fare, Philadelphia House of Refuge.

Breakfast.—Bread, as much as is wanted, and coffee.

Supper.—Mush and molasses, except on Saturdays and Sundays. On Saturdays they have soup, and on Sundays the meat from which the soup from Saturday's supper was made.

Dinner.—Every day except Sundays, they have fresh beef made into soup; 5 oz. of meat without bone are allowed to each boy. On Sundays the dinner consists of bread and molasses.

The coffee is the best Laguira unmixed; 2¼ lbs. are used for 200 boys, and six quarts of milk and 5 quarts of molasses are put into the whole quantity. The aggregate yearly consumption of meat for the number of inmates would, at the rate of 5 oz. per head, amount to 26,462 lbs. The amount actually consumed during the year 1850, was 31,540 lbs; showing that in their soup-meat, 5 oz. of meat without bone was equivalent to 6 $\frac{1}{2}$$_0$ oz. with bone. The soup is made by boiling 5 oz. meat for each person, thickened for 250 persons, with 5 quarts of rice, 1 bushel of turnips, and 10 heads of cabbage. Potatoes and beans are sometimes used in the soup. Rye bread is exclusively used for healthy boys and girls. 100 weight of Indian meal is mixed with 2

barrels of rye flour. The average number of inmates in 1850, was 232, and for these 468 barrels of rye flour and 171 cwt. of Indian meal were used; which if they gained 30 per cent. during their conversion into bread, would give 27 oz. to each inmate per day.

Bill of Fare, Maryland Penitentiary.

Breakfast.—1 herring, ½ lb. bread, ½ oz. coffee, 1 oz. sugar.

Supper.—Bread and coffee, same as breakfast.

Dinner.—*Sunday*, 9 oz. bacon, ½ lb. bread, 12 oz. potatoes. Sometimes beans are substituted for potatoes.

Monday, 12 oz. beef, made into soup, ½ lb. bread.

Tuesday, same as Sunday.

Wednesday, same as Monday.

Thursday, same as Sunday.

Friday, same as Monday.

Saturday, same as Monday.

Fish is given every Catholic fast day. Occasionally Cod-fish is given at other times, in which case, 10 oz. are allowed to each prisoner. If more bread is asked for by a prisoner than the regular allowance, it is always given. Sour crout is generally allowed on Sundays and Tuesdays. The bacon is composed of smoked hog's jaws.

Bill of Fare, Baltimore Jail.

The fare of this institution may be concisely stated: it consists of 1 lb. of bread, and 1 lb. of beef per day, with an allowance of vegetables, 3 times a week. The prisoners do their own cooking, and eat their allowance when and how they please.

Bill of Fare, Baltimore, Alms House.

Breakfast.—8 oz. bread and coffee.

Supper.—8 oz. bread and tea.

Dinner.—*Sunday*, 5 oz. pork or bacon.

Monday, mush and molasses in winter, and rice and molasses in summer.

Tuesday, 8 oz. mutton made into soup, and 4 oz. bread.

Wednesday, 8 oz. beef soup, 4 oz. bread.

Thursday, 8 oz. mutton soup.

Friday, mush and molasses, or hominy.

Saturday, 8 oz. beef soup, 4 oz. bread.

The above is for ordinary purposes; but working men are allowed 12 oz. fresh meat, or 9 oz. bacon. Each pauper has $\frac{3}{8}$ oz. coffee, and $\frac{1}{8}$ oz. tea, (Young Hyson.)

Washington Jail, Bill of Fare.

Breakfast.—$\frac{1}{2}$ a mackerel, or 1 herring, 1 oz. coffee, 11 oz. bread.

No *supper*.

Dinner.—*Tuesdays*, *Thursdays* and *Saturdays*, 1 lb. fresh beef made into soup, 11 oz. bread. Other days, 1 lb. salt beef, and 11 oz. bread. No vegetables given.

Bill of Fare of Penitentiary of District of Columbia.

Breakfast.—Rye coffee, $\frac{1}{2}$ lb. bread.

Supper.—Tea, $\frac{1}{2}$ lb. bread.

Dinner.—*Sunday*, 1 lb. of bacon or corned beef, with potatoes or cabbage.

Fridays, 2 herrings a piece, with potatoes, $\frac{1}{4}$ lb. bread.

Other days, 16 oz. beef made into soup, or 12 oz. pork and $\frac{1}{4}$ lb. bread. The coffee is made wholly of rye. Twice a week Indian bread is served instead of wheat bread; for the remainder of the time, wheat bread is used.

Bill of Fare, Washington Asylum for the Poor.

Breakfast.—1 herring to each pauper every day, except Sunday; as much bread as they wish.

Supper.—Tea and bread.

Dinner.—*Sunday* and *Thursday*, ½ lb. bacon and vegetables.

Monday, *Wednesday*, and *Saturday*, ½ lb. fresh beef without bone, made into soup.

Tuesday, ½ lb. pork or ½ lb. salt beef.

Friday, a herring for each pauper.

The soup is made in the proportion of 16 galls. water to 35 lbs. of meat, and thickened with flour and rice.

For able bodied paupers, corn bread is used, and wheat bread for the old, infirm, and sickly.

4½ bushels of meal per week, and 180 lbs. wheat bread are sufficient for 80 paupers 1 week.

Corn bread is made by scalding 3 bushels of Indian meal in the morning; it is then left till evening, when 1 quart of salt is stirred in, and baked in cakes about 1 inch thick.

Each pauper is allowed as much salt, pepper, and vinegar as he desires.

The coffee is made by adding together ⅓ coffee and ⅔ rye. 12 lbs. of this mixture is given to 80 persons weekly. 1½ lbs. tea are allowed to 80 persons weekly.

Bill of Fare, Boston Lunatic Asylum.

Breakfast.—Coffee and chocolate, with bread at pleasure.

Supper.—Tea and bread.

Dinner.—*Sunday*, boiled rice.

Monday, pork and beans, and rice pudding.

Tuesday, fresh fish and vegetables.

Wednesday, roast meat and vegetables.

Thursday, beef soup and pudding.

Friday, salt fish.

Saturday, roast meat and vegetables.

Cheese for supper twice a week; gingerbread twice a week. I had no means of ascertaining the amount of food consumed per day by the patients in this asylum, nor the daily cost of their provision.

Boston House of Correction.

Breakfast.—Bread and coffee; ¼ oz. coffee to each prisoner.

Supper.—Bread and coffee; ⅛ oz. coffee to each.

Dinner.—*Monday*, *Wednesday*, and *Friday*, 1 lb. boiled beef, and 1½ lbs. potatoes.

Tuesday, *Thursday* and *Saturday*, 1 lb. meat made into soup.

Sunday, baked beef.

½ lb. beef is allowed to women. In addition to the above allowance, men who work hard, are allowed an extra ration of bread of ½ lb. All have 1 lb. of bread per day. Each man is allowed ½ pint of vinegar, and 2 oz. black pepper. On the days for boiled beef, the liquor in which it is boiled, after skimming off the fat, is thickened with Indian meal, and given to the men with their beef. The soup is boiled 2½ hours, and then rice and cabbage are put in and boiled for 2½ hours longer. If any of the prisoners leave any food the preceding day, it is hashed up for them for breakfast.

Massachusetts State Prison.

Breakfast.—*Sunday*, *Tuesday*, *Wednesday* and *Friday*, rice hash.

Monday, cold corned beef and warm potatoes.

Thursday, salt meat, hashed with potatoes.

Saturday, cod-fish, hashed with potatoes.

Dinner.—*Sunday*, cold corned beef, hot potatoes, and mush and molasses.

Mondays and *Fridays*, baked pork and beans.

Tuesdays, *Thursdays* and *Saturdays*, soup.

Wednesdays, boiled corned beef.

Supper.—Bread and coffee twice a week, mush and molasses.

The coffee is made of rye, 9 quarts of which serve for 480 men.

Rice Hash is made by boiling the rice until it is nearly done; minced meat is then added, and boiled for ½ an hour.

Wheat bread is given to any prisoner with whom the rye and Indian bread or the corn bread disagrees.

Convicts are allowed 1 lb. of beef, or 12 oz. of pork, and as much bread as can be made from 10 oz. rye meal and 10 oz. of Indian meal.

For every hundred rations they are allowed 2½ bushels of potatoes, 2 quarts of vinegar, and 4 quarts of salt. In the warm season they are allowed an extra ration of 1 gall. of molasses, and 12 oz. of hops to each 100 rations, which is made into hop beer.

The Warden may at his discretion allow an equal market value of peas, beans or rice in place of potatoes.

House of Industry, Boston.

Breakfast.—½ lb. bread and cocoa.

Supper.—½ lb. bread, ⅛ oz. tea.

Dinner.—*Sunday*, rice and molasses.

Monday, beans and pork.

Tuesday, beef soup.

Wednesday, baked beef.

Thursday, same as Tuesday.

Friday, salt fish.

Saturday, same as Tuesday.

On Mondays, 100 lbs. pork and 2 bushels of beans are allowed for 600 inmates. On Wednesdays the beef is composed of shoulder clods, which are baked 2½ hours; and 5 bushels of potatoes are allowed to 600 persons. On Fridays 140 lbs. salt fish and 5 bushels of potatoes are allowed to 600 persons. The soup is made by boiling 367 lbs. neck pieces and shins of beef in a sufficient quantity of water for 4 hours. Rice is always used as a thickening, and any vegetables which they may have on hand are also put into the soup.

Suffolk Co. Jail.

Breakfast.—Rye coffee, sweetened with molasses.

Supper.—The same.

Dinner.—1 lb. beef, and 2 or 3 potatoes.

4 lbs. of rye coffee are allowed to 100 prisoners, and is sweetened with 2 quarts of molasses.

1 lb. of bread is allowed per day.

The liquor in which the beef is boiled, is thickened with Indian meal, and served with the meat.

As much salt and pepper is allowed to the men as they want, but no vinegar.

Rhode Island State Prison.

Breakfast.—½ lb. bread and coffee.

Supper.—Mush and molasses.

Dinner.—*Sunday*, 6 oz. cold corned beef, 5 oz. of rice.

Monday, 1 lb. of pork or beef.

Tuesday, ½ lb. beef made into soup.

Wednesday, ½ lb. salt fish.

Thursday, 1 lb. pork or beef.

Friday, ½ lb. beef made into soup.

Saturday, pork and beans. 27 lbs. pork, and 26 quarts of beans for 100 men.

The bread is made three parts wheat, and 1 part Indian meal. On cod-fish days, 1½ bushels potatoes are allowed to 100 men; and 3 quarts of milk and 3 lbs. of butter are given as a sauce for the cod-fish.

1¼ lbs. of coffee are allowed to 100 prisoners.

The mush is made at the rate of 20 quarts of meal to 100 men, and each man is allowed ½ a gill of molasses.

Providence Alms House.

Breakfast.—*Monday*, meat, milk porridge and bread.

All other days, meat, coffee, and bread and butter.

Dinner.—*Sundays*, mush of wheat flour, rice, or Indian meal.

Mondays, boiled beef and pork.

Tuesdays and *Thursdays*, soup.

Wednesdays, roast meat.

Fridays, pork and beans.

Saturdays, salt fish and potatoes.

Supper.—Tea and bread and butter.

Each pauper is allowed as much as he wishes to eat; but from the number of lbs. of meat purchased, divided among the average number of paupers, it appears that each pauper consumed daily 16 oz. of meat; i. e. on each day when meat is allowed; 5 oz. of cod-fish.

On Saturdays, 17 oz. bread, $\frac{1}{3}$ oz. butter, $\frac{1}{8}$ oz. tea, $\frac{1}{7}$ oz. coffee, 2 oz. sugar.

Pentonville Prison, England, Bill of Fare.

I have not been able to learn the daily fare of the prisoners at this institution, but the following is taken from one of the annual reports for 1847, of the Inspectors of Great Britain, viz:

28 oz. meat, 140 oz. bread, $3\frac{1}{2}$ pts. soup, 7 lbs. potatoes, 7 pts. gruel, $5\frac{1}{4}$ pts. cocoa, 14 oz. milk, $1\frac{1}{2}$ gills molasses.

The soup is made of the liquor of meat of that day, strengthened by three ox heads, barley, carrots, pepper and some onions.

Gruel is made by boiling at the rate $1\frac{1}{2}$ oz. oat meal in 1 pint of water, and 6 drams of molasses.

Cocoa is made by boiling $\frac{3}{4}$ oz. fealsed cocoa in $\frac{3}{4}$ pint of water, 2 oz. milk, and 6 drams of molasses.

	Pounds.						Ounces.							Fractions of a Pint.			
	Beef.	Pork.	Flour.	Rice.	Raisins or Dried Fruit.	Pickles or Cranberries.	Biscuit.	Sugar.	Tea.	Coffee.	Cocoa.	Butter.	Cheese.	Beans.	Molasses.	Vinegar.	Spirits.
									Either.								
Sunday	1		$\frac{1}{2}$		$\frac{1}{4}$		14	2	$\frac{1}{4}$	1	1						$\frac{1}{4}$
Monday		1					14	2	$\frac{1}{4}$	1	1			$\frac{1}{2}$			$\frac{1}{4}$
Tuesday	1			$\frac{1}{2}$			14	2	$\frac{1}{4}$	1	1	2	2				$\frac{1}{4}$
Wednesday		1				$\frac{1}{4}$	14	2	$\frac{1}{4}$	1	1			$\frac{1}{2}$			$\frac{1}{4}$
Thursday	1		$\frac{1}{2}$		$\frac{1}{4}$		14	2	$\frac{1}{4}$	1	1						$\frac{1}{4}$
Friday	1			$\frac{1}{2}$			14	2	$\frac{1}{4}$	1	1	2	2		$\frac{1}{2}$		$\frac{1}{4}$
Saturday		1				$\frac{1}{4}$	14	2	$\frac{1}{4}$	1	1			$\frac{1}{2}$		$\frac{1}{2}$	$\frac{1}{4}$
Weekly quantity	4	3	1	1	$\frac{1}{2}$	$\frac{1}{2}$	98	14	$1\frac{3}{4}$	7	7	4	4	$1\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$1\frac{3}{4}$

VALUATION OF THE WEEKLY QUANTITY, &c.

3	pounds of	pork,	at	$7\frac{1}{2}$	cents per pound,		$22\frac{1}{2}$ cents.
4	do	beef,	"	6	do		24 "
1	do	flour,	"	4	do		4 "
1	do	rice,	"	3	do		3 "
$\frac{1}{2}$	do	raisins, &c.,	"	13	do		$6\frac{1}{2}$ "
$\frac{1}{2}$	do	pickles, &c.,	"	$12\frac{1}{2}$	do		$6\frac{1}{4}$ "
98	ounces of	biscuit,	"	4	do		$24\frac{1}{2}$ "
14	do	sugar,	"	8	do		7 "
$1\frac{3}{4}$	do	tea,					
7	do	coffee,	of same value.	80	do		$8\frac{3}{4}$ "
7	do	cocoa,					
4	do	butter,	"	23	do		$5\frac{3}{4}$ "
4	do	cheese,	"	16	do		4 "
$1\frac{1}{2}$	pints of	beans,	"	24	cents per gallon,		$4\frac{1}{2}$ "
$\frac{1}{2}$	do	molasses,	"	64	do		4 "
$\frac{1}{2}$	do	vinegar,	"	20	do		$1\frac{1}{4}$ "
$1\frac{3}{4}$	do	spirits,	"	64	do		14 "
		Averaging 20 cents per day, or weekly,					$1 40

RATIO FOR U. S. ARMY.

¾ lb. pork or bacon, or 1¼ lbs. of fresh or salt beef; 18 oz. of bread or flour, or 12 oz. of hard bread, or 1¼ lbs. corn meal; and at the rate eight quarts of peas or beans, or, in lieu thereof, ten pounds of rice; 6 lbs. of coffee; 12 lbs. of sugar; 4 quarts of vinegar.

A.—*Table shewing the quantity of food allowed to each person weekly, at the following institutions.*

Name of Institution.	Meat per week.	Bread per week.	Potatoes.	Rice.	Beans.	Salt Fish.	Indian Meal.	Tea.	Coffee.	Molasses.	No. of persons in each institution.	Solid food per week.
	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	oz.	oz.	gills.		lbs. oz.
Emigrant Refuge, N. Y.	2 8	9 0	0 9	0 1¼	0 2	0 8	1	⅞	3½	*	2361	12 13
Nurseries, Randall's Island, N. Y.	2 6⅜	7 0	*	6	*	4	3	0	0	2½	1384	9 13⅜
Alms House, (males,) N. Y.	5 8	9 8	1 0	*	7	12	0	⅞	2⅝	0	1328	16 12
Alms House, (females,) N. Y.	3 0	8 0	1 0	5	*	12	0	⅞	2⅝	0		13 9
Penitentiary, Blackwell's Island	7 8	8 12	6	6¾	10	0	11	⅞	2¼	4½	790	18 5
Alms House, Philadelphia	2 8	10 8	2 7	6½	0	3	4	7-9	2 4-5	3	1813	16 4
Moyamensing Prison, Philada.	*	8 12		*	*	*					196	
Eastern Penitentiary, Philada.	5 7	8 12	4 0	5	4¾		*	12-14	⅜	5	310	18 12
House of Refuge, Philada.	2 10½	12 0	2	6½	*		10	0	1 1-6	3	244	15 13
Maryland Penitentiary	4 11	10 8	2 4			1 12	0	0	3⅜	0	229	19 3
Baltimore Jail	7 00	7 0					0	0	0	0	95	14
Baltimore Alms House	2 5	8 12	1 11	6¾	1½		2 0	⅞	2⅝	2	582	15 3½
Washington Jail	7 00	4 13				1 12	0	0	7	0	30	13 9
Washington Penitentiary	6 00	8 12	8	2		8	0	⅞	3	0	70	15 14
Washington Alms House	3 00	5 0	8			8	0	¼	2½	0	79	9 00
Boston House of Correction	7 00	7 0	4 8	*	*	0	2	0	3 1-7	1	450	18 10
Massachusetts State Prison	6 8	10 8	10 8	*	*	12	4	0	7	2	480	28 8
Boston Alms House	2 7¾	7 0	1 0	2	4	3⅝	0	⅞	0	1	600	11 1⅜
Boston Jail	7 00	7 0	2 10	0	0	0	0	0	3½	¼	110	16 10
Rhode Island State Prison	3 10⅓	7 0	14	0	5	8	2 10	0	1 2-5	3	98	14 15
Providence Alms House	4 2	7 7	8	3	9	5	2 00	⅞	1	2	153	15 2
							oatm'l.					
Pentonville Prison, England	1 12	8 12	7 00	0	0	0	5¼	0	0			17 13¼
							wh. flr.					
U. S. Navy	7 00	6 2	00	1 00	15	0	1 0	1⅛	0			16 1
U. S. Army	7 00	7 14		2½					1			15 0
Body Guard of Duke of Hesse Darmstadt												13 8

* Unknown.

Table B.

Shewing the total cost of support of each person, and the cost for Provisions, Salaries, Fuel and Clothing for each person for one week.

	Cost of Provision.	Salaries.	Fuel.	Total expense.	Clothing.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Emigrant Refuge, N. Y.	76	28	06	2 38‡	20
Nurseries, Randall's Island, N. Y.	36.9	12.1	03.1	74	19
New York Alms House	47	06.7	03	70.2	13.7
Penitentiary, Blackwell's Island	52.9	41.6	05.1	1 08.6	9
Philadelphia Alms House	50	18.7	09	1 04	16
Moyamensing Prison, Philada	56	77	11.2	1 84	10
Eastern Penitentiary, Philada					
Philadelphia House of Refuge	43	36	4⅓	1 28	19
Maryland Penitentiary	56	1 23	11½	2 73	13
Baltimore Jail					
Baltimore Alms House					
Washington Jail					
Washington Penitentiary	43	2 11	† 16	2 98	10½
Washington Alms House					
Boston House of Correction	2 07	25½	8¾	2 53	11¾
Massachusetts State Prison	46⅔	71¼	9½	1 81½	23½
Boston Alms House	62	22	10	1 61	13
Boston Jail	*	53	6⅞	1 85	*
Rhode Island State Prison	66½	93	† 19½	2 08	9
Providence Alms House	47	13½	10½	1 25	9
Pentonville Prison, England	83	*	*	2 88	12¾
U. S. Navy	1 40				
U. S. Army	90				
N. Y. City Prison	28	75	8	1 24	2
Average of 12 Lunatic Asylums			24	2 51	

* Unknown.

† Including lights.

‡ Including hospital and building expenses.

Table C.

Shewing the average weekly cost in Massachusetts of supporting paupers IN *alms houses, the cost* OUT *of alms houses, the value of pauper labor, the cost of alms houses, the number of acres of land attached to each house, and the value of alms house property, &c.*

	No. of Alms Houses in County.	Average weekly cost of supporting each pauper in alms house.	Average weekly cost of supporting paupers out of alms houses.	Average No. of paupers supported in alms houses.	No. of acres of land attached to alms houses.	Net amount of expense of supporting and relieving paupers, including interest on alms house property.	Estimated value of alms house property.	Estimated value of labor performed by paupers.	Number of persons in alms house unable to perform labor.
Suffolk	4	$1 16	$ 0 88½	1,101	184¼	$114,486 20	$158,800 00	$1,600 00	3,816
Essex	22	1 08½	52	752½	2,425¾	71,022 69	210,900 00	3,262 00	438
Middlesex	38	1 35 17–37	85	761	3,715½	66,062 25	282,599 25	2,822 00	393
Worcester	45	1 05	1 14	545¼	6,810	43,537 77	185,837 80	3,372 00	309
Hampshire	6	96	1 09	82	610	11,885 78	15,950 00	262 00	50
Hampden	9	1 08	1 65⅓	188	1,107	17,624 14	45,100 00	545 00	361
Franklin	9	1 16	97 4–20	54	975	12,311 29	23,144 04	426 75	13
Berkshire	2	1 00	1 10½	34	320	10,715 65	11,000 00	30 00	15
Norfolk	20	1 14	72 3–10	425	1,684	41,224 32	129,200 50	2,165 00	360
Bristol	17	90½	81	445	1,619	35,265 49	97,100 00	1,935 00	398
Plymouth	19	97	96	242	983	21,160 76	59,294 80	1,080 40	154
Barnstable	12	1 03	96	141½	209¼	11,540 08	24,200 00	371 00	81
Nantucket	1	1 20	37½	54	12	8,700 00	12,000 00	95 00	41
Dukes			1 64			2,423 00			
	204	$1 08½	$0 98	4,825¼	20,654¾	$467,959 42	$1,255,125 89	$17,966 15	6,429

Table D.

Shewing the number of jails in Massachusetts, the weekly average cost of board for each prisoner, the average weekly total cost of each prisoner, the average number of prisoners, the average weekly cost of fuel, &c.

	Number of Jails.	Average weekly cost of board.	Average number of Prisoners.	Average weekly cost of fuel for each Prisoner.	Total weekly cost of each Prisoner.	Number of rooms in Jails.
				cts.		
Suffolk	1		111	6 1/6	$1 85	75
Essex	3	$1 66 2/3	36	38	2 31	41
Middlesex	3	1 48 1/3	40	16 2/4	2 25	50
Worcester	1	1 40	9	*		44
Franklin	1	2 25	3	16	3 15	8
Hamp-hire	1	1 75	8	14 1/2	2 47	3
Hampden	1	1 75	14	8 1/2	2 04	*
Berkshire	1	1 75	7	10 1/2	2 47	*
Norfolk	1	1 56	28	10 3-5	†1 46	9
Bristol	2	1 75	17	13 3-5	2 35	26
Plymouth	1	1 50		*	*	7
Barnstable	1	2 00	1		3 35	6
Nantucket	1	1 50	10		*	4
Dukes	1	1 75			*	3
Average		$1 68	284		2 37	

The number of prisoners who died in 1850, for which year this table is compiled, was only 5, or 1 76–100 per cent. of the average number for the year, or 8–100 per cent. for the whole number committed. No labor performed in any of the jails.

* Unknown.

† Evidently erroneous, but exactly according to the account given by the institution.

Table E.

Shewing the results of the following Houses of Correction in relation to the weekly average cost of board for each prisoner, the annual average number of prisoners, the weekly average cost of salaries for each prisoner, &c.

	Average weekly cost of board.	Average number of prisoners.	Weekly average cost of board, salaries, per capita.	Total average weekly cost per capita.	Average weekly cost of fuel per capita.
Suffolk	$2 07	331	$0 35	$2 06	$0 12
Essex	1 80	75	*	*	*
Middlesex	1 25	103	63	3 20	11
Worcester	1 40	40	44	3 17	24¾
Franklin	1 75	3	*	2 57	16¾
Hampshire	1 75	5	*	3 43	23½
Hampden	2 00	42	*	2 03	8½
Berkshire	1 75	18	*	1 93	*
Norfolk	1 75	26	*	1 63	8½
Bristol	1 75	72	26	2 43	8
Plymouth	1 50	0	*	*	*
Barnstable	2 00	2	*	*	5½
Nantucket	50	3	*	*	13½
Dukes	1 75	2	*	*	*
Average	1 65	719	42	2 49	13 1–10

19 prisoners died during the year, being an average of 2 74-100 per cent. of the average number, and 6-100 of 1 per cent. on the total number.

* Unknown.

Table F.

Shewing the amount of carbon and nitrogen in various articles of food, from Liebig, Prout and Pereira.

	Per centage by weight of carbon.	Per centage of nitrogen.
Wheat starch	37.5	
Gum Arabic	36.3	
Anhydrous cane sugar	47.5	
Sugar of milk	40.0	
Citric acid	43.63	
Butter	65.06	
Mutton fat	78.996	
Hog's lard	79.098	
Albumen	55.	15.920
Tibrine	55.	15.817
Gluten	55.22	15.98
Wheat—dried in vacuo at 230° Fahr	46.1	2.3
Oats—dried in vacuo at 230° Fahr	50.7	2.2
Rye	46.2	1.7
Potatoes	12.26	37
Peas	35.74	4.2
Beans	38.24	4.4
Fresh bread	30.15	
Ox blood	10.39	15.08
Fresh meat, without fat	13.6	
Ditto, with 1-7th fat, and cellular tissue	21.75	
Dry muscular beef	51.89	15.05
Roasted deer	52.60	15.23
Roast beef	52.59	15.21
Roast veal	52.52	14.70
Indian corn	41.00	2.00

Table G.

Containing a summary of the victuals consumed during November, 1840, by a company of the Body Guard of the Grand Duke of Hesse Darmstadt, in one month, composed of from 27 to 30 men, averaging 28½ men. The amounts represent the food of 855 men for one day.—Liebig's Organic Chemistry applied to Physiology, p. 289.

1840—November, in the period from the	No. of men supplied with food.	Beef.	Pork.	Potatoes.	Peas.	Beans.	Lentils.	Sour Krout.	Green Vegetables.	Bread in Soup.	Salt.	Onions, leeks, &c.	Pepper,—Price in kreutzers.	Fat or Lard.	Vinegar.
		lbs.	lbs.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz	lbs.	lbs.	lbs.	lbs.	lbs.	kreutzers.	oz.	pints.
1st to 5th	139	36	9	147 0	4 15½	3 7¼		20	12	5	4¼	4	2¼	13¼	
6th to 10th	145	37	9	165 6				16	70	7½	5	3¾	2¼	10$\frac{5}{6}$	
11th to 15th	136	36	9	153 2		3 7¼		16	42	7½	4½	3¼	2	8	
16th to 20th	136	37	9	177 10	3 5	3 7¼		16	12	6	4¼	4¼	3¼	13⅓	
			Saus'ges												
21st to 25th	147	39	7¼	171 8			3 5½		36	7½	5½	5¼	2¼	5⅓	1¼
26th to 30th	152	30	19¼	177 10	3 5	3 7½		32		2¼	4	3¾	2½	5⅓	
Total	855	215	63	992 4	11 9¼	13 14	3 5¼	100	172	36	28	20¼	15½	56	½
The average No. of men daily fed is 855-30 28½ — Monthly.		7 31/57	2 12/57	34 13	6 87/171	7 135/171	1 150/171	3 11 91/151	6 6/171	1 15/57	56/57	11 7-9	31/57	1 55/57	3/57
		oz.	oz.	lb. oz.	oz.	oz.	oz.	oz.	oz.	lbs.	lbs.	oz.	kreutzers.	oz.	pint.
Therefore each man — Daily.		4 4/171	1 153/855	1 2 54/95	371/1710	222/855	107/1710	1 149/151	3 187/855	36/855	28/855	324/855	31/1710	56/855	3/1710

Table H.

Shewing the amount of the elements contained in various bills of fare. The table refers to the amounts taken weekly, throughout.

Institutions.	Nitrogen.	Carbon.
	oz.	oz.
Pentonville Prison, England	8.20	102.96
State Prison, Mass.	22.40	124.46
House of Correction, Boston	17.67	100.72
Emigrant Refuge, New York	10.80	67.47
Alms House, Boston	9.23	64.72
Alms House, Providence	14.57	76.55
Alms House, Baltimore	11.01	79.44
Alms House, New York	18.61	92.98
Alms House, Philadelphia	12.07	78.71
Alms House, Washington	10.24	58.58
State Prison, Rhode Island	13.74	87.28
State Prison, Maryland	17.84	93.67
State Prison, Washington	19.46	92.28
State Prison, Philadelphia	17.81	91.72
Penitentiary, Blackwell's Island	22.26	112.69

Table I.

Shewing the value of pauper labor in alms houses, the average number in each alms house, and the annual amount per capita.

	Average number of paupers during the year.	Aggregate earnings of paupers for one year.	Annual earnings of each pauper.
Blockley Alms House, Philadelphia	1.813	$8.539	$4 71
House of Industry, Boston	733	3.471	4 73
Alms Houses in County of Suffolk, Mass	1.101	1.600	1 45
" " Essex, "	752	3.262	4 33
" " Middlesex, "	761	2.822	3 70
" " Worcester, "	545	3.372	6 20
" " Hampshire, "	82	262	3 20
" " Hampden, "	584	545	2 90
" " Franklin, "	54	427	7 90
" " Berkshire, "	34	30	88
" " Norfolk, "	425	2.165	5 09
" " Bristol, "	445	1.935	4 35
" " Plymouth "	242	1.080	4 46
" Baltimore	555	5.646	10 18
" Providence	141	2.348	16 37
Aggregate of all Alms Houses in New York	9.000	28.353	3 15
Total	16.871	65.857	
Average earnings per annum per head			3 91

Table J.

Shewing the aggregate value of convict labor, the annual value per capita.

	Annual value of convict labor.	Number of Convicts.	Amount annually earned by each convict.
Moyamensing Prison, Phil.	$21.895	196	$111 71
Eastern Penitentiary, Phil.	12.184	300	40 61
House of Refuge, Phil.	6.420	244	28 66
Penitentiary, Washington	1.515	70	21 64
All the Houses of Correction in Massachusetts.	22.312	719	31 03
Maryland Penitentiary	15.175	229	66 27
Rhode Island State Prison	2.348	40	58 70
Massachusetts State Prison	43.890	480	91 43
Pentonville Prison, England	.....	.....	24 26
Maine State Prison	3.462	67	45
New Hampshire State Prison	4.735	82	59
Vermont State Prison	6.713	62	64
Connecticut State Prison	14.148	175	85
Aubnrn do N. Y.	54.762	645	97
Sing Sing do N. Y.	81.850	672	103
Clinton do N. Y.	9.210	124	62
New Jersey do	16.798	185	90
Philadelphia do Cherry Hill	11.990	299	40
Virginia do	11.442	199	57
Ohio do	37.883	336	88

Table K.—*Shewing the sexes, civil condition, and causes of pauperism in the State of Rhode Island, compiled from the Report of Thos. R. Hazard, Esq., Commissioner of the Poor of R. I., A. D.* 1850.

TOWNS.	Sex.			Nativity		Cause of Pauperism.									Civil State.		
	Males.	Females.	Total.	Born in Rhode Island.	Born out of Rhode Island.	Insane.	Intemperate.	Old age.	Imbecility.	Infirmity.	Immorality.	Domestic Quarrels.	Death and desertion of friends.	Misfortune.	Married.	Single.	Children.
Newport	30	24	70	37	33	26	20	1	3	1		2	1		28	23	16
Portsmouth	6	8	15	15		4		1	5	2					7	7	1
Middletown	3		3		3										1		2
Little Compton	7	5	13	11	2		3	1	3	2	2			1	3	9	1
Tiverton	4	4	14	14			8		1	2	1				4	4	6
Bristol	6	5	15	15		4	3	1	2		1				4	7	4
Warren	5	9	14	12	3	5		1	2	4			1		8	6	
Providence	41	51	136	69	67	14	49	4	2	20	10		21		30	62	44
North Providence	6	4	15	14	1		7	2							5	5	5
Smithfield	6	11	28	26	2	1	11	4	1	4			1		11	6	11
Cumberland	12	4	20	13	7	1	7		6	1					5	10	4
Burrillville	2	3	8	7	1		4						4		5		3
Gloucester	4	2	7	7		3			2	1					1	5	1
Torster	5	4	1	10	1	5	2	1	1						3	5	2
Scituate	8	6	14	11	3	1	1	3	7	2					6	8	
Johnstown	4	6	19	18	1			1	4	2			3		4	5	9
Cranston	4	4	12	12		1	7		1	3					2	6	4
Warwick	4	3	11	10	1	1	1	1		4					3	3	4
East Greenwich	5	3	8	8		2		1	1	2				1	7	1	
Coventry	1	8	16	13	3	3	3		1	3					3	5	7
West Greenwich	3	5	9	9		1	1	2	1	2					5	2	1
North Kingston	6	5	12			3	5		1						4	7	1
South Kingston	11	11	23	23		6	5	2	5	2					8	13	1
Charlestown	5	1	6	6			3			2							
Westerly	2	3	5	4	1		1	1	2						2	3	
Hopkinton	4	4	8												3	4	1
Exeter	2	5	8	8		2			1	2							
	186	198	520	375	126	83	141	27	52	61	15	2	31	2	162	206	128

Note 1.—The disparity between the aggregate of the first two columns and the column marked total, is caused by children under 12 years of age.
Note 2.—5.2 per cent. of pauperism caused by old age.
10 per cent " " imbecility.
11.8 per cent. " " infirmity.
24.6 per cent. " " childhood.
15.9 per cent. " " insanity.
67.5 per cent. " " the above, all of which disable the parties from profitable labor.

Table L.

Showing the cost of maintaining the poor in fifteen Asylums in Rhode Island, A. D. 1850.

	Keeper's Salary.	Annual products of asylums.	Average No. of inmates.	Whole cost of asylum and land.	Interest on cost of asylums.	Whole cost of supporting poor, including interest on cost of asylums.	Cost of maintaining each individual.
Cumberland	$300	$1,100	35	$13,000	$780	$2,780	$79 43
Smithfield	400	600	22	8,500	510	1,510	68 63
Cranston	185	400	15	3,500	210	1,000	67 33
E. Greenwich	200	335	10	4,000	240	658	65 80
Scituate	200	851	11	4,952	297	680	61 81
N. Providence	300	545	25	5,200	312	1,512	60 48
Warwick	225	150	14	3,800	228	840	60
Middletown			8	1,00	60	460	57 50
Bristol	200	700	15	6,000	360	860	57 33
Warren	200	1,000	15	8,000	480	830	55 33
L. Compton	200	550	14	4,00	240	740	52 87
Newport	325	1,000	80	15,000	900	3,650	45 62
Providence	600		205	40,000	2,400	9,246	45 20
Tiverton	200	500	16	6,000	360	646	40 57
Portsmouth	200		15	5,0,0	300	330	22 00
		$7,631	500	$127,952	$7,677	$25,732	

Note 1.—Average cost of supporting paupers in asylums, $51 50 per annum.

Note 2.—Average cost of supporting all the paupers of all kinds, $50 00 per annum.

Note 3.—Average cost of supporting all the paupers in R. I., $33,500 per annum.

Note 4.—Population of Rhode Island, 148,000.

Note 5.—The ratio of paupers to population is 1 in 2205.

Note 6.—The cost of supporting the poor in Rhode Island is 22.6 cts. per capita, per annum.

Table M.

Shewing the cost of supporting the poor in 16 *towns that have not asylums in Rhode Island, A. D.* 1850.

Towns.	Number of Poor.	Annual sum paid by town.	Cost per individual.	Mode of keeping Poor.
Hopkinton	15	$1,000	$66 66	Lowest bidder.
Gloucester	15	900	60	Lowest bidder.
Jamestown	6	350	58 33	Boarded by contract.
Burrillville	10	550	55	Lowest bidder.
N. Kingston	11	600	54 54	Boarded by contract.
Barrington	1	50	50	Do.
Charlestown	7	350	50	Do.
W. Greenwich	8	375	46 87	Lowest bidder.
Coventry	12	594	49 50	Do.
Torster	11	500	45 45	Do.
Westerly	15	600	40	Boarded by contract.
Exeter	8	300	37 50	Lowest bidder.
New Shoreham	5	169	33 80	Do.
S. Kingston	18	500	33 33	Boarded by contract.
Johnstown	29	860	29 65	Do.
Richmond	1	at Hospital.		
	171	$7,798		

Note 1.—Average cost for each individual per annum, $45 60.